ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

McGraw-Hill Co. of California

OCTOBER 1946

25c a Copy

California Farmers are different!

Consider, for example, that the per capita income of California's farmers is the highest income of farmers anywhere in the nation. One reason, of course, is the fact that they farm electrically—use eight times as much power as the average U. S. farm. California farmers are *electrical* farmers! As such they represent an immensely rich market for new electrical equipment!

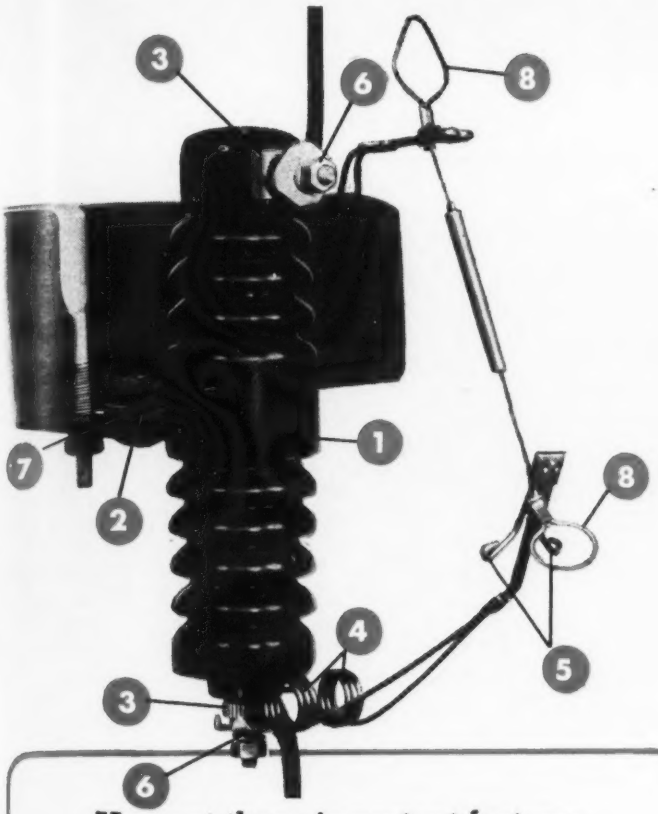
In advertisements like those shown here, which appear regularly in farm publications, the Edison Company points out the many advantages of electrical farming.

We are proud that this kind of advertising through the years has helped make Edison-served farms among the largest users of electrical equipment in the world!

SOUTHERN CALIFORNIA EDISON COMPANY

1896-1946
SERVING THE WEST FOR FIFTY YEARS

ELECTRICAL WEST with which is consolidated The Journal of Electricity), October, 1946. Vol. 97, No 4. Published monthly by the McGraw Hill Company of California, 68 Post Street, San Francisco 4, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rates—U. S., U. S. Possessions and Latin American Republics: $2, 1 year; $3, 2 years; $4, 3 years. Canada: $2.50, 1 year; $4, 2 years; $5, 3 years. Other countries: $3, 1 year; $5, 2 years; $6, 3 years. Single copy, 25c. Copyright, 1946. McGraw-Hill Company of California. All rights reserved.



Improved

G-E FLIP-OPEN FUSE CUTOUT

7500/12500 Grd Y and 15000 Volts, 50 Amperes

For Rural Service

This improved G-E Flip-open fuse cutout of simple construction, provides inexpensive primary fusing for rural line service—where circuit conditions impose a less severe interrupting duty on the cutout, and where the advantages of the conventional hinged fuseholder type of cutout may be dispensed with.

This cutout provides over-current protection by means of a fuse link, without a hinged fuseholder tube. Expulsion action is obtained entirely by the fuse link tube—a unitary part of the fuse link. The fuse link is supported in tension between spring contact arms, which pull the lower cable terminal out of the fuse link tube when the fuse link melts.

A complete description of this improved G-E Flip-open cutout for rural service, Bulletin GEA-4224, may be obtained through your G-E representative or by writing to Apparatus Department, General Electric Company, Schenectady 5, N. Y.

You get these important features in the G-E Flip-open fuse cutout

1. *Wet-process solid porcelain insulator,* **with undercut petticoats, provides for greater insulating strength.**

2. *Mounting support cemented in back of porcelain insulator,* **makes cutout virtually birdproof against short circuits from fuse contacts to hanger, thereby preventing unnecessary fuse blowings.**

3. *Terminal studs, supporting fuse contacts,* **are cemented in porcelain insulator, providing increased strike distance from live parts to hanger. Also assures positive location and non-twisting alignment of fuse contact arms.**

4. *Helical-wound, nickel plated, double coil springs* **of strong copperweld steel retard sideway of contact arm and avoid vibration stresses on the fuse link. These assure proper tension on fuse link and positive separation of blown fuse when fault occurs.**

5. *Double-wedge contacts, nickel plated,* **permit fuse link to be inserted from either side of the cutout. Contacts grip the fuse link cable with heavy pressure, securely holding the cable ends after fuse link has blown.**

6. *Exceptionally strong clamp-type terminals* **each provide for positive clamping of either one or two conductors No. 1/0 or smaller.**

7. *Mounting of cutout to hanger bracket* **enables side-swivel, vertical or angle-tilted mountings. Shakeproof lock washer securely holds cutout in mounted position.**

8. *Fuse-link with ring loop at each end* **enables easy insertion or removal with switchhook. Either Hi-Surge, or conventional types of Flip-open fuse links, are applicable.**

406-19-5600

GENERAL ELECTRIC

ELECTRICAL WEST

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CHANGE OF ADDRESS

Circulation Manager,
Electrical West,
68 Post St.
San Francisco, Calif.

Please change my address

From .....

To .....

Signed .....

Preview

ATOMIC ENERGY

All the complex questions which obscure the future of atomic energy in power production will be examined, and many of them answered for the first time next month, in what is perhaps the most outstanding article ELECTRICAL WEST has been privileged to publish in many years.

Source of the article is a study prepared as a project of the Carnegie Endowment Committee on Atomic Energy. This organization, represented at the University of California by Prof. J. B. Condliffe, in cooperation with the Northern California Association of Scientists, called together a group to consider the social impact of atomic energy. Result of their effort is not new findings, but an analysis. Information which has been made known, but which had appeared bit by bit throughout the United States, is assembled and presented in a form suitable for use by research workers and administrators in the more non-technical fields.

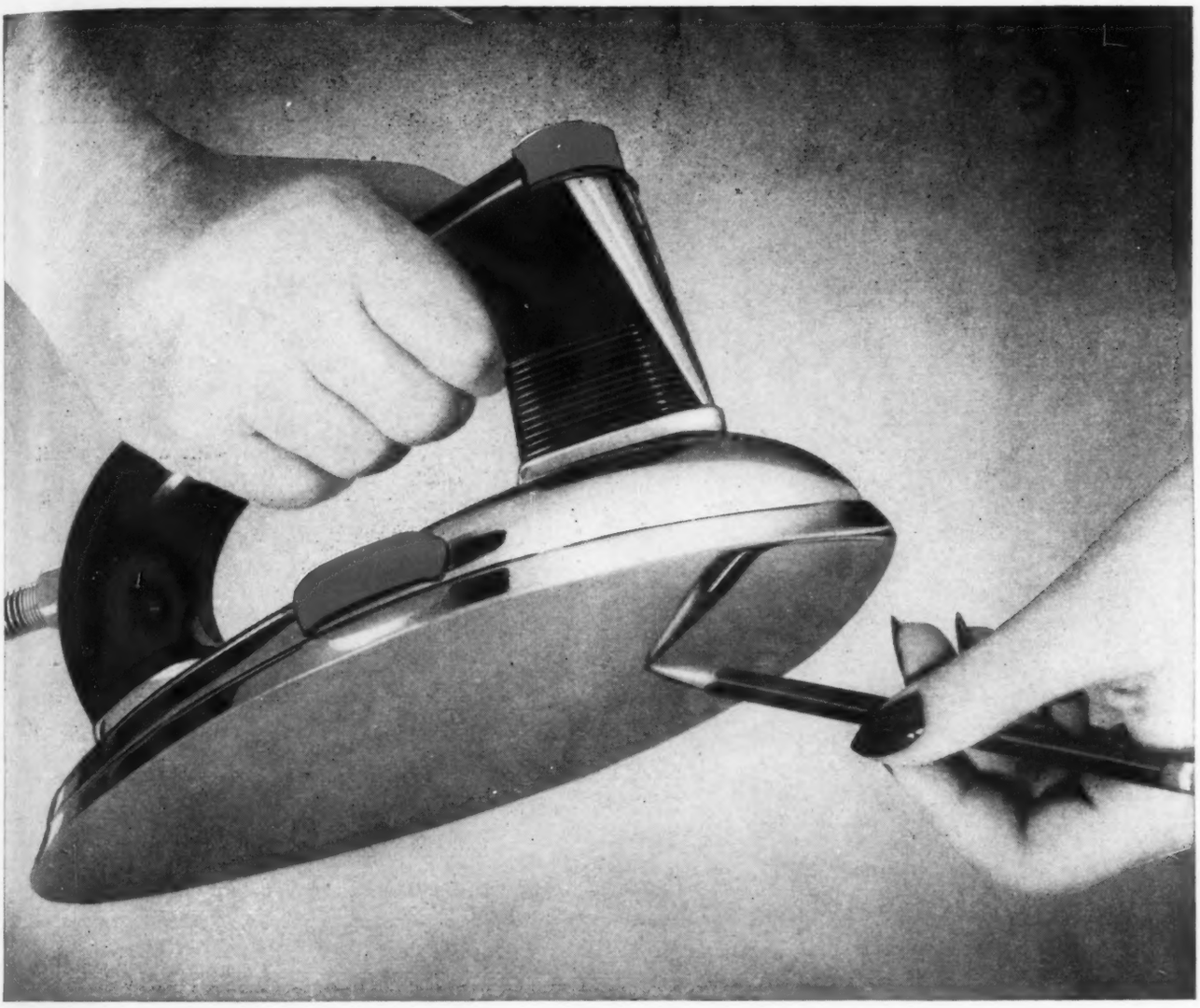
The study first approaches the subject from four viewpoints in turn. These approaches are the geological, the theoretical, the engineer's and the industrial. It then proceeds with a detailed analysis of costs, and reaches certain conclusions.

In this study the group has assembled a summary of reported information which may well serve as an outline plan for evaluating atomic energy for many months to come.

Unlike the *New Yorker*, ELECTRICAL WEST will also publish in the same issue each of those departments which regularly report to the various branches of the industry.

COVER PHOTO

Western industry in action. This Ryan Aeronautical Co. photo, taken in the San Diego plant, exemplifies one of Ryan's highly developed techniques for welding stainless steel. Another is the atomic-hydrogen welding process (see story on page 78).



TRU-HEAT CONTROL reacts to minute changes in temperature faster than ordinary types of iron heat regulators. It holds heat within narrower limits than five other leading makes tested.

The soleplate is part of the heat control!

THE SOLEPLATE of the new General Mills Tru-Heat Iron expands and contracts during ironing—and that minute action makes and breaks the heating circuit. Thus, the very surface in contact with the fabric being ironed controls ironing temperature. This super-accurate control of ironing temperature means valuable protection for even the most delicate of the modern types of fabrics.

But that's not *all!* The new scientifically shaped *4-Way, Full-Vue Soleplate* covers more ironing at every stroke . . . the all around *Button Bevel* permits ironing under buttons with any part of the iron edge . . . the unique *Safety Side Rest* ends tiresome lifting . . . the *Tru-Heat Fabric Selector*, marked with both fabric and actual temperature settings, makes it possible to iron every fabric at its own best temperature. These vital new features work together to make ironing—*and selling*—faster and easier!

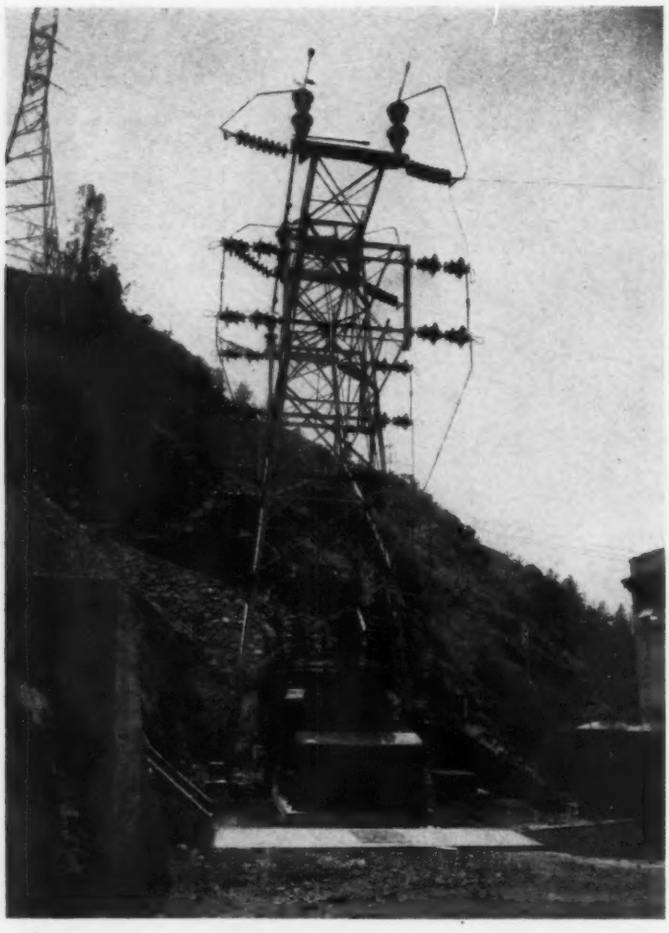
NOW BEING DISTRIBUTED IN: Minnesota, Nebraska, the Dakotas, Wisconsin, Iowa, Upper Michigan, Montana, Idaho, Wyoming, Utah, Colorado, New Mexico, and parts of Illinois and Indiana. Other states to follow soon! General Mills, Inc., Home Appliance Dept., Minneapolis 13, Minn.

THE IRON SPONSORED BY Betty Crocker

Betty Crocker is a trade name of General Mills, Inc.

There finally comes a time when

How Good



The Conductor with a sleeve full of service stripes, as he pulls his old heavy watch from his pocket, has probably forgotten to ask himself "How good is it?". He knows! Years of accurate timing have long since answered that question... Likewise, the user of a "well-worn" O-B insulator no longer wonders "How good is it?" He knows!... It's true of many things that look alike, test alike, really *are* alike, when new, that the buyer will wonder which will best stand the years of service that lie ahead. The most reliable answer doesn't exist in the new thing at hand, but in the experience that other people have had with that same product for a generation or more --people who once asked "How good is it?", but now *know!*... A few of these cases with O-B Insulators are illustrated on this page. Once, a long time ago, someone might have wondered "How good are they?" Now they know!

In 1926, this structure was built with O-B suspension insulators, switch and bus insulators, hardware, and oil-filled bushings. The entire line, similarly equipped, has operated at 110 Kv. for the intervening 20 years with complete satisfaction.

2655-H

Ohio Brass

MANSFIELD, OHIO

CANADIAN OHIO BRASS CO., LTD.,
NIAGARA FALLS, ONT.

HEADQUARTERS FOR PORCELAIN INSULATION

you KNOW...

it is!

Entering its 19th year, this O-B-insulated line has maintained a high service record.

For the past 21 years — since 1925 — the operation of this line with O-B pintype insulators has been branded by its owners as "excellent".

Leader has always worked towards the finest in fluorescent lighting, excellent workmanship, careful design, accurate engineering . . . for New Horizons in fluorescent lighting.

In the latest Leader success, the New Horizon Series, you will find Leader quality throughout; plus new streamlining and simplicity made possible by Slimline Tubes.

The New Horizon Series are trim, compact, streamlined; they lend themselves to modern trends of architecture and especially long in-line continuous run installations.

The New Horizon Series feature the new Slim-line F96T8 tubes and are manufactured for both Industrial and Commercial installations. There is a Leader Representative in your area with complete information on the New Horizon Series.

Distributed only through the better electrical wholesalers.

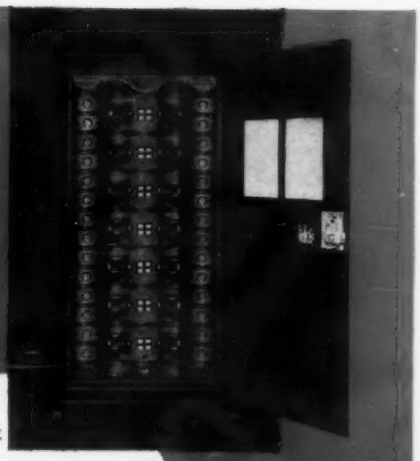
LEADER ELECTRIC MANUFACTURING CORP.

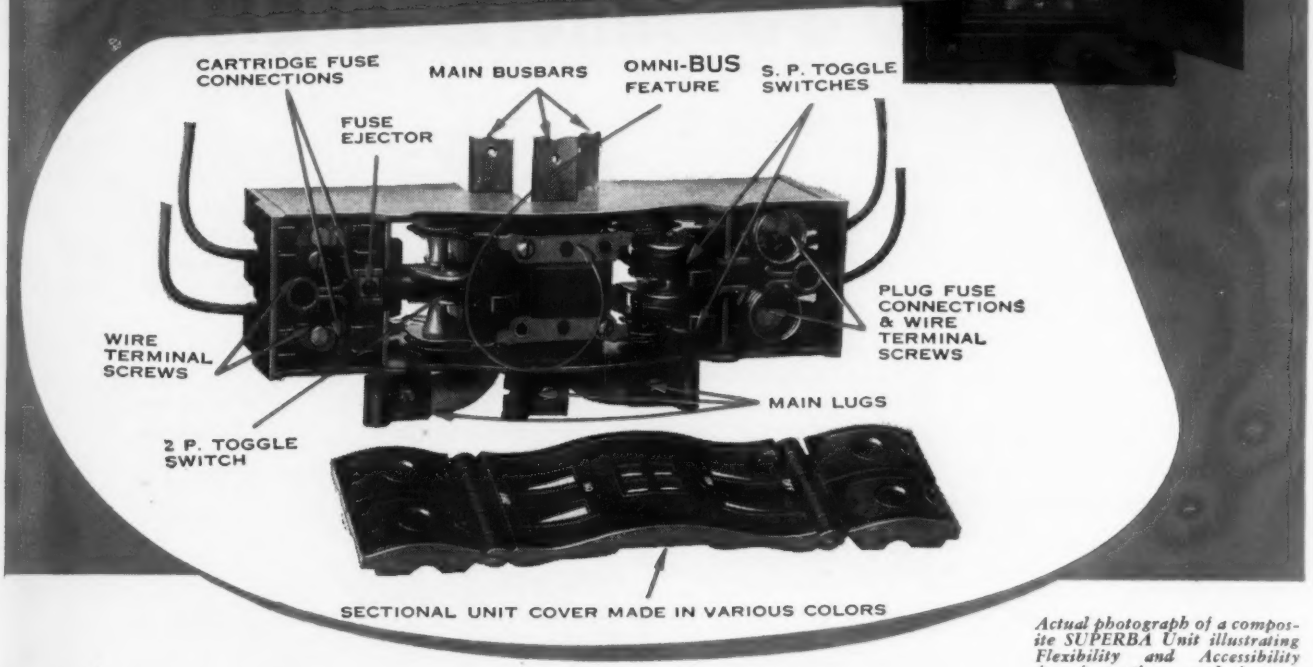
6127 NORTH BROADWAY • CHICAGO 40, ILLINOIS

★

WEST COAST FACTORY • 2040 LIVINGSTON STREET, OAKLAND 6, CALIF.

Superba Panelboards have no "Retirement Age"





Actual photograph of a composite SUPERBA Unit illustrating Flexibility and Accessibility for inspecting, replacing or interchanging Toggle Switches, Fuse Connections or Bus Bar arrangements without removing cabinet door or trim.

6 FEATURES . . . the secret of adaptability

Many a panelboard has been put out to pasture because it couldn't meet the challenge of changing electrical conditions.

But you need never worry about obsolescence when you install BullDog SUPERBA. There are six separate features of design and construction to insure complete safety, peak performance, unusual convertibility, easy maintenance and long life. Look them over:

1. **Toggle Switches:** Sturdy construction to withstand abuse . . . positive operation . . . quick make and quick break.
2. **Switch and Fuse Safety Interlock:** Doors over fuse compartments are interlocked with toggle switches so that fuses are always "dead" when accessible, although fuses can still be tested in circuit.
3. **Fuse Ejector:** In cartridge fuse type. Just a flip of the finger ejects the cartridge fuse with safety and convenience.
4. **Omni-bus Construction:** Permits ready change of voltage and phase, and balancing of load on the phases, after the panel is installed and without removal of door or trim or disturbing branch circuit wiring.
5. **Isolation Compartments:** Bus bars, fuses and switches are in separate compartments, preventing flash-overs and localizing trouble from short circuits or defective fuses.
6. **Smart Styling:** Surface or face plates of bakelite have a curved design with a variegated grain finish, lending beauty and symmetry to the panel's appearance.

Check these six advantages of SUPERBA Panelboards, and write for complete details on this modern, completely flexible equipment.

SUPERBA is adaptable to any of these systems:

125/250 V. Single Phase AC or DC Edison System.
125/250 V. Grounded Neutral Single Phase AC or DC Edison System.
125/250 V. Grounded Neutral 3 to 3-Wire Single Phase AC or DC Edison System.
120/208 V. 3-Phase, 4-Wire AC.
125 V. 3-Phase to Single Phase AC.
125 V. 2-2 Wire.

BullDog Also Manufactures Vacu-Break Safety Switches—BUStribution DUCT—Switchboards—Circuit Master Breakers—Industrial Trol-E-Duct for Portable Tools, Cranes and Hoists—Universal Trol-E-Duct for completely flexible lighting.

BULLDOG

ELECTRICAL DISTRIBUTION SYSTEMS

BULLDOG ELECTRIC PRODUCTS COMPANY, DETROIT 32, MICHIGAN. In Canada: BullDog Electric Products, Ltd., Toronto. Field Engineering Offices in All Principal Cities

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES:

Coast Electric & Manufacturing Co.
1720 N. E. Sixth Avenue Tel. Garfield 2844
Portland, Oregon

Safety Switchboard Company
1445 Stevenson St. Tel. Hemlock 2470
San Francisco, Calif.

Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
Los Angeles, Calif.

Latest developments

U·S·S American Electrical

MANY notable improvements have been made in electrical wire and cable during the past few years. The accompanying illustrations exemplify some of the more recent developments in which better engineering at the American Steel & Wire Company has resulted in superior electrical wire and cable for both standard and special applications.

Now we proudly offer more weather-resistant coverings, jackets and finishes; greater immunity of conductor insulation and lead sheaths to chemical soil actions; synthetic rubber; natural rubber; resin; asbestos; varnished cambric and paper insulations; all with better heat resistance and improved over-all electric characteristics.

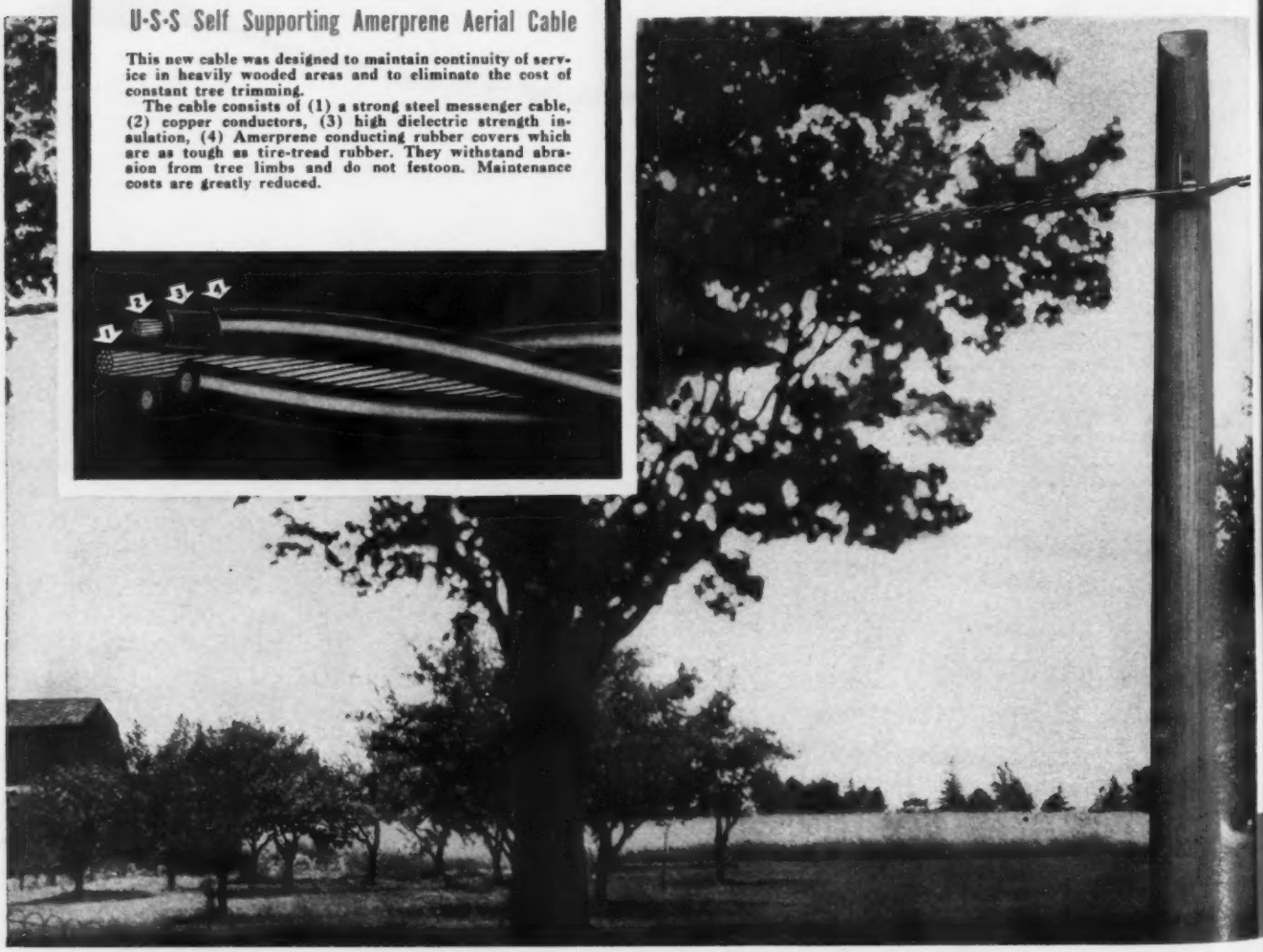
Newly designed supports, dead ends, and other accessories further enhance the life of overhead power and signal conductors.

No matter what type of wire or cable you need, you'll find that American Steel & Wire Company either makes it or will design it to fit your particular needs. Write for specific information.

U·S·S Self Supporting Amerprene Aerial Cable

This new cable was designed to maintain continuity of service in heavily wooded areas and to eliminate the cost of constant tree trimming.

The cable consists of (1) a strong steel messenger cable, (2) copper conductors, (3) high dielectric strength insulation, (4) Amerprene conducting rubber covers which are as tough as tire-tread rubber. They withstand abrasion from tree limbs and do not festoon. Maintenance costs are greatly reduced.



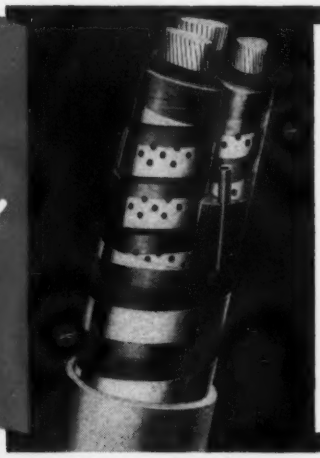
in

Wire and Cable

Engineered to fit the job!

PS Shielded Varnished Cambric Cable

The use of semi-conducting tape as an improved method of shielding power cable is a recent development of American Steel & Wire Company research laboratories. It has proved highly successful in eliminating air gaps and consequent spark discharges with attendant corona and ozone formation. These improved U·S·S Varnished Cambric Cables can be used at higher voltages and at higher temperatures.

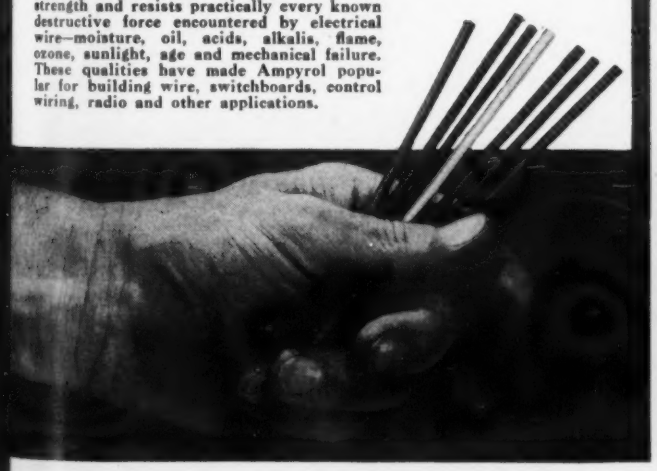


PC Pressure Compensated Paper Cable

Designed to handle heavy loads at higher temperatures, this cable keeps internal pressure from building up above prescribed limits. It has three gas-filled tubes included in its assembly, perforated at intervals to allow the oil compound to be forced into the tubes as the cable heats up under load. This compresses the gas and prevents development of excess pressures.

U·S·S Ampyrol Synthetic Resin Insulated Wire

Designed primarily for a thin walled building wire which would permit greater current carrying capacity in a conduit of given size. Ampyrol insulation has high dielectric strength and resists practically every known destructive force encountered by electrical wire—moisture, oil, acids, alkalis, flame, ozone, sunlight, age and mechanical failure. These qualities have made Ampyrol popular for building wire, switchboards, control wiring, radio and other applications.



U·S·S Amerductor and P.F.T. Armor Rods

FOR RURAL ELECTRIFICATION

This combination results in a stronger rural line with high conductivity which can be installed at low cost. U·S·S Amerductor consists of two galvanized copper conductors and one high-strength galvanized steel wire. P.F.T. Armor Rods give superior protection at the supports and practically eliminate outages caused by vibration, flash-over, pitting, burns, chafing and mechanical damage.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

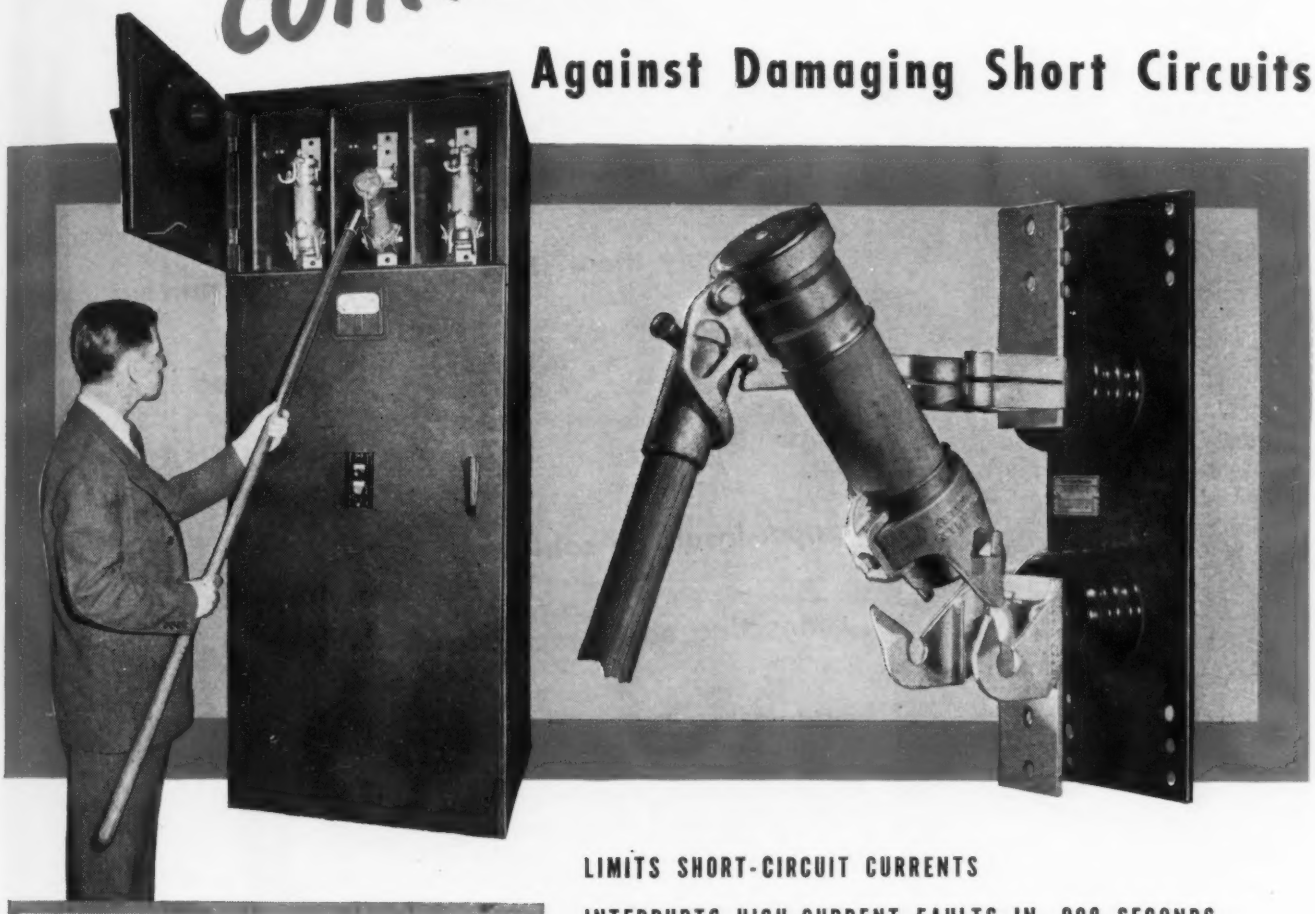
UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S American Electrical Wire & Cable

Fairchild Aerial Surveys, Inc.
more capacity on-the-spot...
WITH YEARS OF MAINTENANCE-FREE SERVICE
Utility installation of 180 Kva, 2400 volt, single phase, 2 bushing, 60 cycle individual outdoor capacitor units connected in "y" on a 4160 volt system.
C-D capacitors provide the simplest and most flexible method for boosting power load at critical spots without the addition of costly equipment, lines, and maintenance. Pole-mounted or arranged in banks for large blocks of reactive kva, they adapt power distribution systems for any present or future load shifts. C-D capacitors can be shunted easily from the banks and quickly installed at critical load points. Each unit is weather-sealed against corrosion and discharges in accordance with NEMA requirements for complete handling safety.
Cornell-Dubilier offers prompt service from its large range of Capacitors in all sizes and types for utility applications. Our field engineers will be glad to consult with you. Or write to Cornell-Dubilier Electric Corporation, South Plainfield, New Jersey.
CORNELL-DUBILIER CAPACITORS
FOR POWER-FACTOR IMPROVEMENT
CARRIER-CURRENT COUPLING
A PERFECT CASE FOR C-D CAPACITORS
Heavy metal case hermetically seals components and protects them against the abuse of frequent shifting. 10 to 15 years of effective life is a conservative estimate for C-D capacitors.

Boric Acid Current-Limiting Fuse Provides . . . controlled protection Against Damaging Short Circuits



Safe and Easy to Insert No Special Tongs Required

Restoring service is a quick, safe, simple operation with the new Westinghouse Type BAL Current-Limiting Fuse.

One switch motion with the hookstick does it. No "aiming" is necessary because a self-aligning hinge guides the upper end of the fuse accurately into position.

Another advantage in making replacements: fuse fittings are simply removed and clamped on the new fuse unit. An easy-to-see indicator readily spots blown fuses.

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

TYPE BAL *CURRENT-LIMITING* FUSES

LIMITS SHORT-CIRCUIT CURRENTS

INTERRUPTS HIGH-CURRENT FAULTS IN .008 SECONDS

SILENT, FLAMELESS OPERATION

Get greater protection for both connected apparatus and feeder system with the BAL Current-Limiting Fuse. It prevents short-circuit currents from reaching their maximum value and controls surge voltage to safe values during interruption. It's the answer to the increasing demand for a power fuse with higher interrupting capacities than possible with noncurrent-limiting type fuses.

The BAL limits and interrupts, in .008 seconds, faults on circuits capable of delivering up to 80,000 amperes at 7500 volts. It limits short-circuit current on high-capacity systems for such applications as power transformers and high-voltage motor starters . . . gives adequate protection for installations close to generating source.

Complete information about the Type BAL Current-Limiting Fuse is given in Booklet B-3430. Write for it today. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60586-A

ONE PRODUCT FROM THE COMPLETE LINE OF WESTINGHOUSE DISTRIBUTION APPARATUS

Oilostatic is flexible, economical and AS SIMPLE AS THIS:

ITS ESSENTIAL ELEMENTS ARE SIMPLE

TRENCH
Trench need not be over 18" wide and 48" deep. No ducts or concrete envelope required.

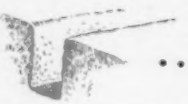
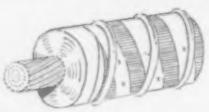
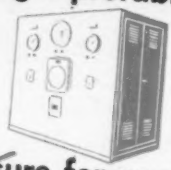
PIPE
Welded pipe, protected against corrosion, bends cold to any contour and can get through space a foot wide.

CABLE
Regular solid type cable with "D"-shaped armor. Three or more cables installed simultaneously *without lead*.

JOINTS
Easily-bolted steel casing unit provides armor-plate protection. Design is mechanically strong, simple to install.

POTHEADS
Preassembled design. Splicing crew can install 3 per day.

PUMPING UNIT
A single prefabricated dual pumping unit and reservoir automatically supervises and controls the system.

The Oilostatic Transmission System requires only these steps: . . . digging a narrow trench  . . . placing in it a welded steel pipe . . . pulling in solid type paper-insulated cable  . . . then connecting easily-made joints and potheads . . . installing a prefabricated pumping unit and reservoir.  . . . applying 200 lbs. oil pressure for operation up to 230,000 volts.

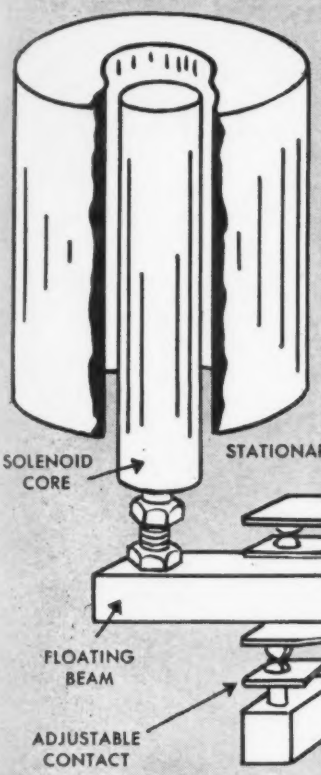
Further information about Oilostatic, the super-oil-filled cable transmission system, is yours for the writing. Ask for Bulletin OK1025 when you write to The Okonite Company, Passaic, New Jersey.

OKONITE - CALLENDER
paper insulated power cables

4663

"Feather-Touch" Control

It Helps Give You Closest Line Regulation With Allis-Chalmers 5/8% Step Regulators

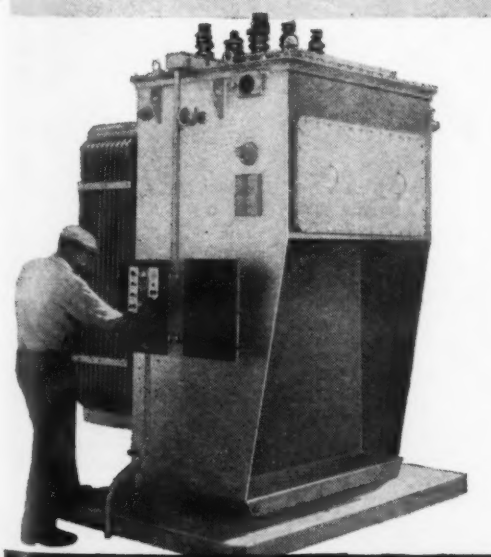


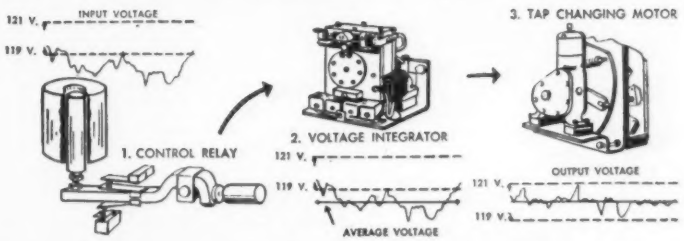
☛ "Feather-Touch" control relay employed on A-C 5/8% Step Regulators is a prime factor in ability of regulator to hold voltage within plus-minus 3/4 volt.

☛ No holding coils are required. Absence of damping effect of coils means that floating beam can closely follow every fluctuation in line voltage.

☛ No overshooting or slowed-down response in "Feather-Touch" control relay — 5/8% band width is held easily.

☛ Combined with "voltage integrator" used in control for Allis-Chalmers 5/8% Step Regulators, the "Feather-Touch" relay makes possible the closest feeder regulation to be had today!





Control Arrangement for A-C 5/8 % Step Regulators

INPUT VOLTAGE fluctuations are accurately followed by "Feather-Touch" control relay, and are fed into "voltage integrator." Integrator sums up these fluctuations, and starts operation of tap-changing motor whenever average voltage is outside band setting, thus maintaining voltage at desired level. For complete description of A-C 5/8% Step Regulators, call our nearby sales office, or write directly to ALLIS-CHALMERS, MILWAUKEE, WIS.

A-2060

ALLIS-CHALMERS

★ One of the Big 3 in Electric Power Equipment ★
Biggest of All in Range of Industrial Products

5/8% STEP REGULATORS

Locke

SINCE 1893

INSULATOR

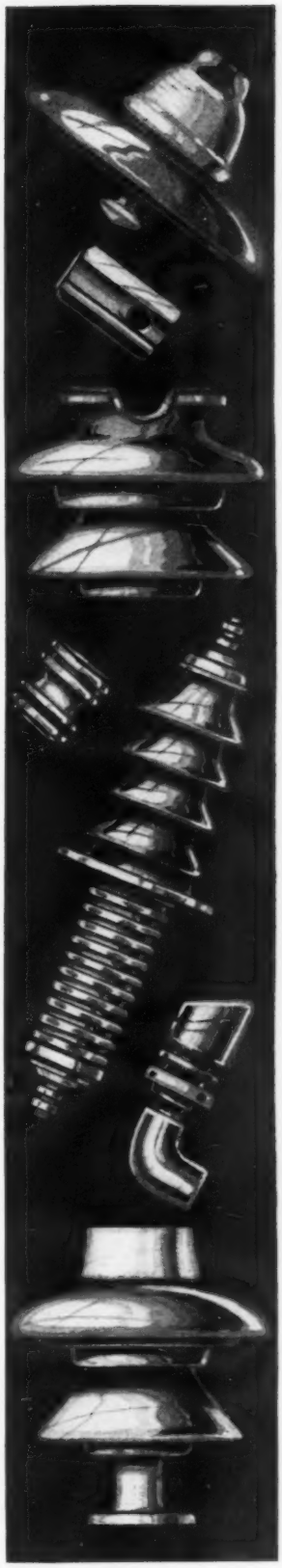
THE OLDEST AND LARGEST

WE REFUSE TO GAMBLE WITH YOUR MONEY...

Sure--we *could* take a chance--but

we didn't get our reputation that way. Locke makes a science of inspection. At each operation in their manufacture, your insulators have to pass the critical eye of a different member of the Locke Quality Control* team.

The Q.C.* man at the left is test-painting unfired suspension insulators with a special light oil. If he finds one tiny imperfection out goes the piece. He is actually "Your Man in our Plant"; he and the other members of his crew safeguard your insulator dollars through our production processes . . . and there's neither argument nor compromise with their decisions. Your insulators have to be the best that can be made.



******Quality Control is the application to manufacturing operations of modern inspection methods and statistical analysis to assure that the finished product will fulfill its service requirements.*

DISTRIBUTORS ON THE PACIFIC COAST

GENERAL ELECTRIC SUPPLY CORPORATION

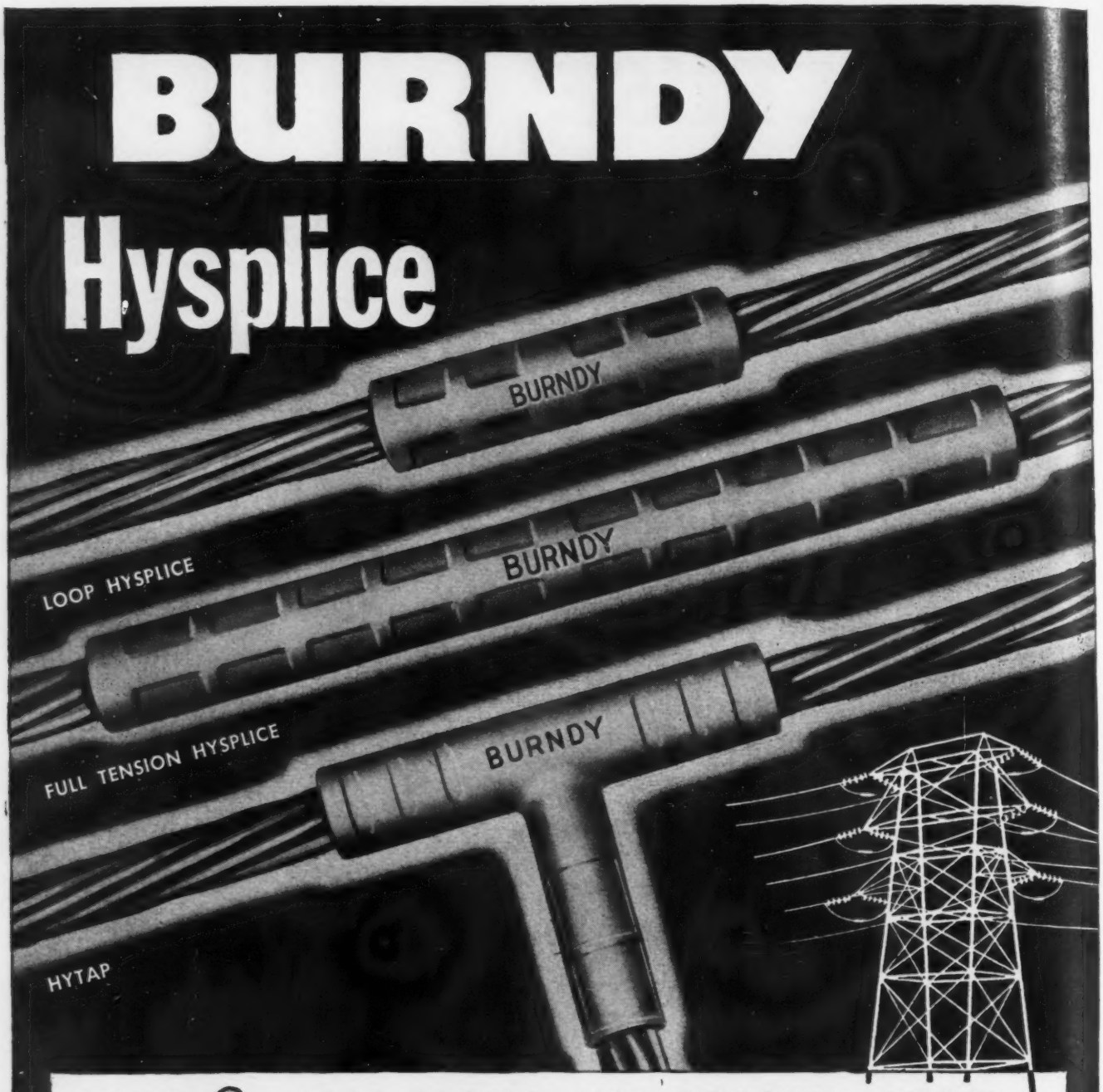
OFFICES IN PRINCIPAL CITIES

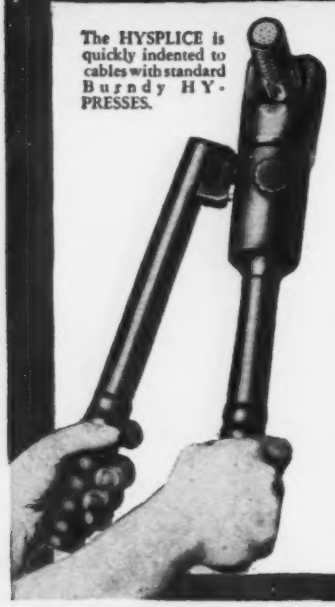
CORPORATION BALTIMORE MARYLAND

MANUFACTURER OF WET-PROCESS PORCELAIN INSULATORS

BURNDY

Hysplice





The HYSPLICE is quickly indented to cables with standard Burndy HY-PRESSES.

FOR LOOPS AND TENSION LINES

The Burndy Hysplice supplies the answer to the problems of loose connections, corrosion, and burn-offs, on high tension and overhead lines.

Available in types for copper and ACSR, the HYSPLICE is readily installed with familiar Burndy portable hydraulic HYPRESSES, with suitable dies. The Burndy method of crimping provides the following advantages:

1. **develops the full strength of conductors, where needed.**
2. **provides low resistance connections *even on* oxidized conductors.**
3. **rounded surfaces reduce corona discharge.**

Each Burndy HYSPLICE is filled (sealed ready for use) with a special compound PENETROX "A" for ACSR—PENETROX "C" for copper, which *wipes oxide from conductor surfaces during installation, reducing transverse resistance — permanently seals against corrosion — and, keys connector to conductor for greater mechanical strength!*

Ask your local Burndy representative for details, or write . . .

Burndy Engineering Co., Inc., 107V Bruckner Blvd., N. Y. 54, N. Y.

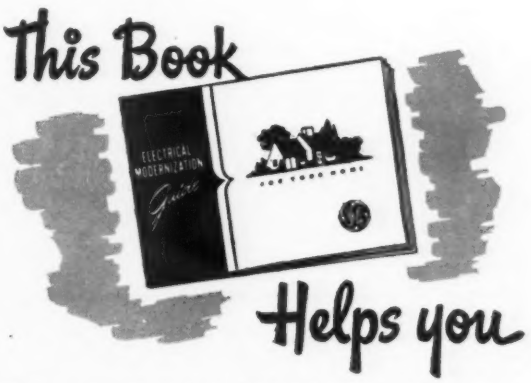
In Canada: Canadian Line Materials, Ltd., Toronto 13

GIVE A LIFT TO home modernization WITH GE WIRING DEVICES

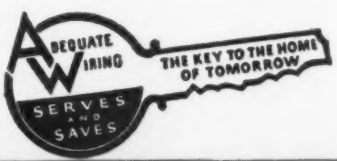
Many homes *must* be modernized electrically to make full use of new appliances and devices necessary for good living. But it's up to you to *show the difference* between a minimum-cost circuit addition and a thorough job—one that leaves the whole house "wired for tomorrow."

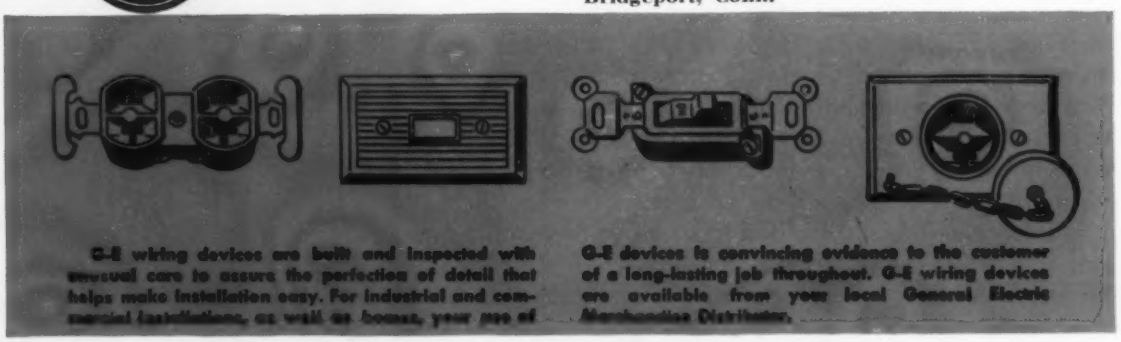
General Electric's full line of wiring devices can help give a lift to the job. For when you suggest *G-E wiring devices* throughout, homeowners will be assured that they are getting soundly built products, free from the quality-cutting they fear so much today.

What's more, you can use specific G-E devices to accent the modern way: Silent switches in bedrooms—waterproof outlets on porches and patios used for dining—clock outlets conveniently located.



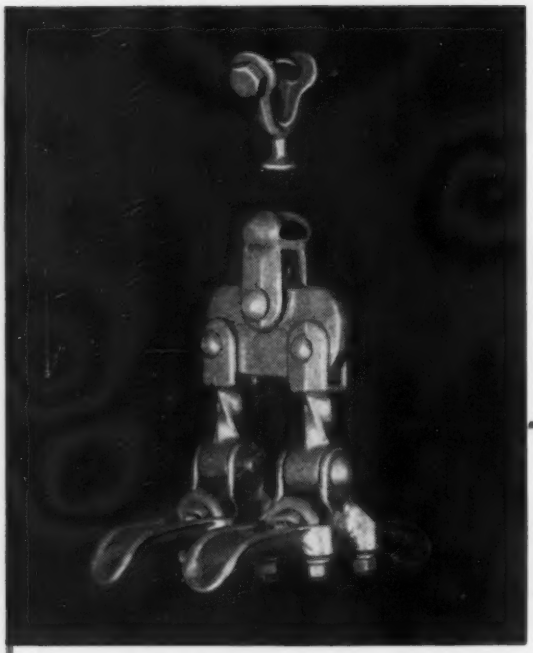
This book, *Electrical Modernization Guide*, is offered householders to interest them in modernization of their present homes. You'll find a copy useful when discussing modernization jobs. For your copy, write Section D20-1018, Appliance and Merchandising Dept., General Electric Company, Bridgeport, Conn.





G-E wiring devices are built and inspected with unusual care to assure the perfection of detail that helps make installation easy. For industrial and commercial installations, as well as homes, your use of G-E devices is convincing evidence to the customer of a long-lasting job throughout. G-E wiring devices are available from your local General Electric Merchandise Distributor.

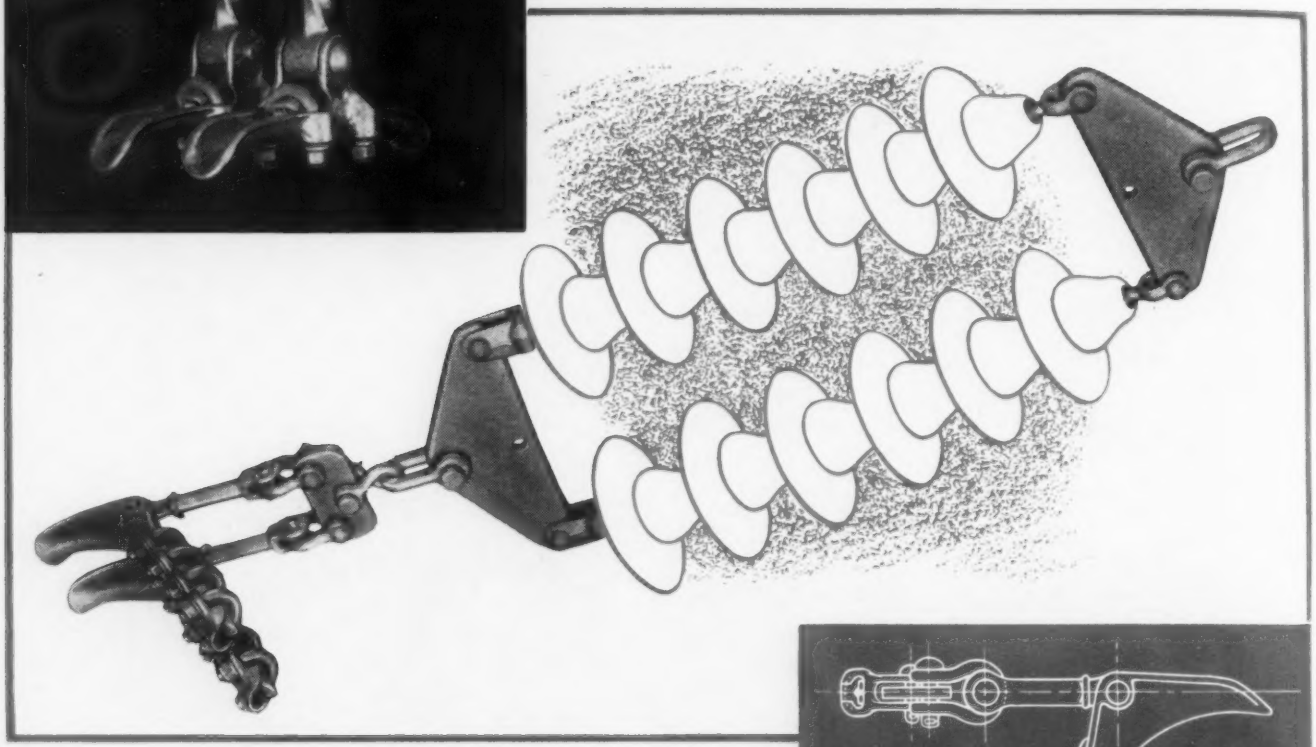
GENERAL ELECTRIC

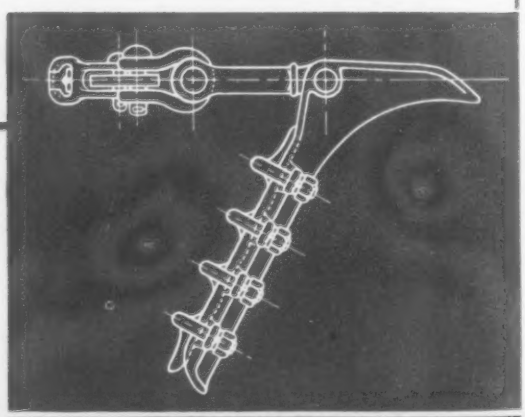


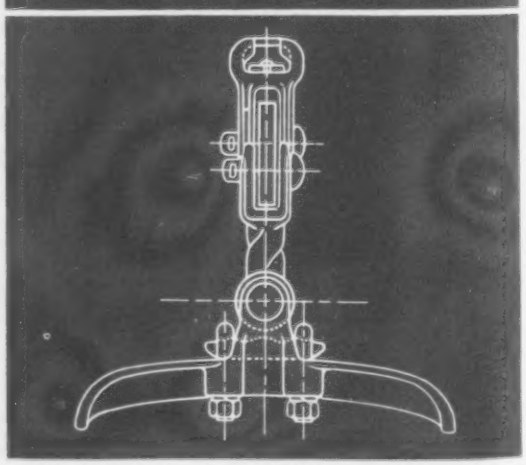
FOR TRANSMISSION LINE DESIGN USE BTC

STANDARD DROP FORGED STEEL LINE HARDWARE

For Special Construction Requirements







When necessary to depart from standard transmission design practice in order to meet special requirements, it is very desirable to use a minimum of special parts.

On one such job, wartime conditions made necessary the use of twin conductors in horizontal parallel.

Suspension and Dead-ending Assemblies for this installation, designed and produced by B.T.C. in cooperation with the Utility engineers, are shown.

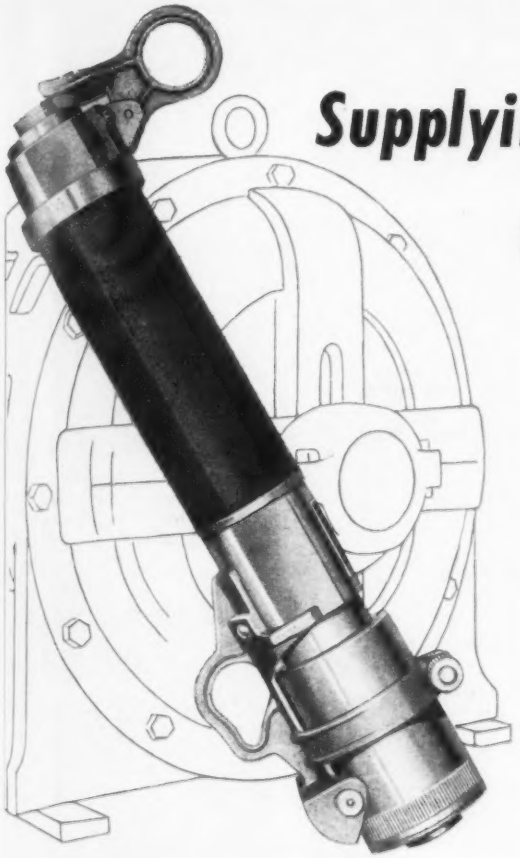
Only ONE SPECIAL PART, the Short Yoke Plate, was used. All others were Standard Clamps, Plates, and Fittings, some of which were hot-formed to meet the assembly requirements.

The use of Drop Forged Steel Line Hardware allows considerable flexibility of design—Standard parts may be machined or hot-formed to special dimensions without sacrificing essential strength—or heat-treated to increase their inherent strength and resistance to shock and fatigue.

Sold only through your insulator manufacturer

THE BREWER-TITCHENER CORPORATION

CORTLAND, NEW YORK



Supplying Adequate Protection for HIGH VOLTAGE polyphase MOTORS

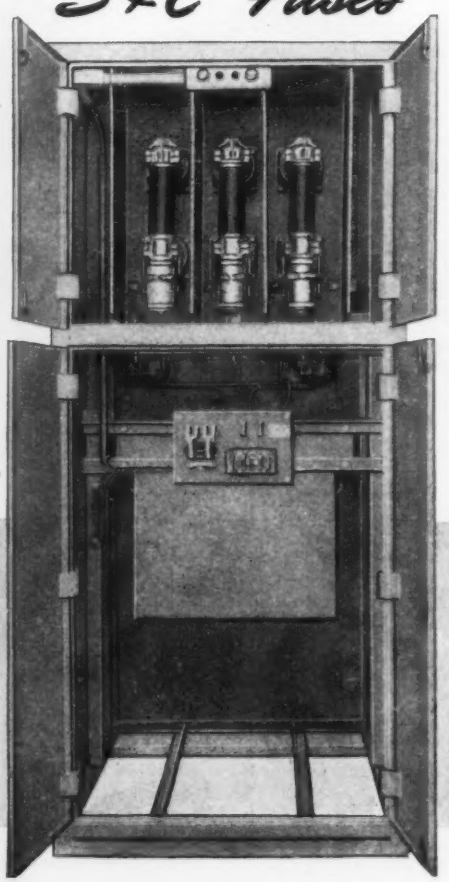
Where high voltage motors are employed there is likely to be a high concentration of power, and consequently severe short circuit conditions. The requirements of such installations urge the application of S & C Type S M Power Fuses, for adequate short circuit protection.

Type S M Fuses in one form have the high interrupting capacity required to provide protection where short circuits up to 40,000 r.m.s. amperes might occur. This high interrupting capacity results from a boric acid arc extinguisher of proper design.

Confining the arc within the fuse, S & C Type S M Fuses with condensers often result in important economy of space in cubicles and cell structures. They have highly accurate fusible elements which retain their accuracy under all conditions. Blown fuses may be restored to service by the simple replacement of an inexpensive refill unit.

S & C Type S M Fuses are made for various applications, 2,300 to 138,000 volts and 1 to 400 amperes. Bulletin 242 covers high voltage motor applications. Ask for it today.

Type S M
(BORIC ACID)
S & C Fuses



SCHWEITZER & CONRAD, INC.
4425 Ravenswood Avenue — Chicago 40, Illinois, U.S.A.

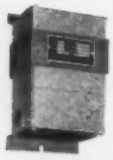
Represented in Principal Cities (Consult Telephone Directory)
In Canada by Powerlite Devices, Ltd., Toronto, Canada

In the typical motor starter application shown at the left, S & C Type S M Fuses provide adequate and economical short circuit protection while oil-immersed contactors and overload relays supply the overload protection.

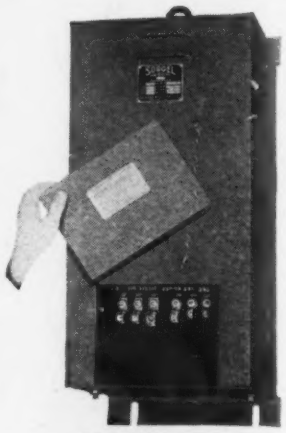
As revealed here, Type S M Fuses and Condensers require a minimum of space when housed in a steel cubicle. They are of the disconnect type, and may be handled with a hook stick.

"Experience will choose an S & C Fuse"

SORGEL AIR-COOLED TRANSFORMERS



1/4 KVA.
Single Phase
460/230 to
115 volt.



15 KVA. 3-phase
Showing connection compartment with solderless terminals

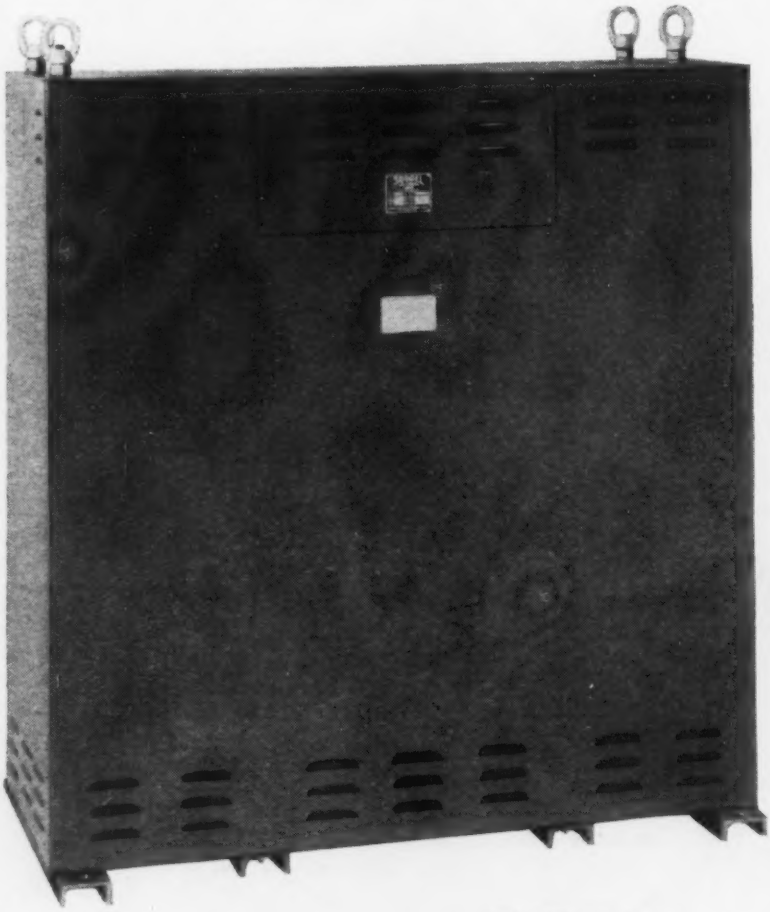
for Every Purpose

To operate 115 volt lighting and portable equipment from 230-460 or 575 volt power circuit.
¼ to 333 KVA. Single phase. 1 KVA. to 1,000 KVA. 3-phase.

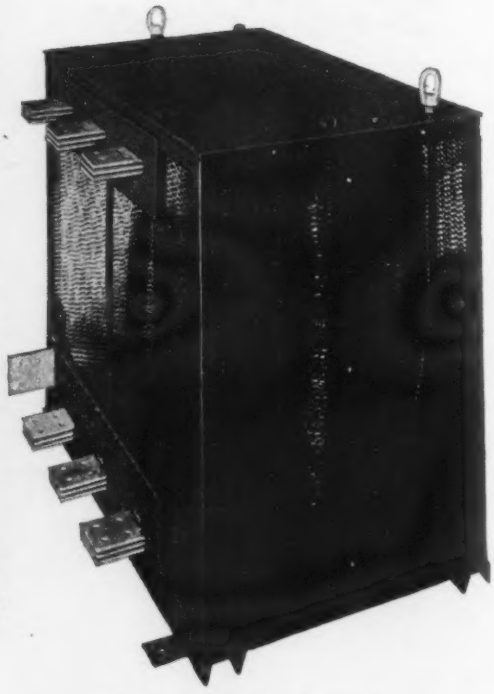
To operate special equipment from standard circuits, to change odd voltages to standard voltages, and phase changing.

For interior high voltage distribution systems with transformers at load centers. Sizes up to 1,000 KVA. Voltages up to 13,200.

Special 4600 Volt
Electronic Transformer



500 KVA. 3-phase.
4160 Volt Transformer. For Indoor Sub-Stations



Booster Auto Transformer
1000 KVA. 3-phase. 208/120 to 240 volt.

SORGEL ELECTRIC CO.
844 W. National Ave., Milwaukee 4, Wis.

REPRESENTATIVES

FRED W. CARLSON
307 Wall, Seattle, Wash.
Rt. 6, Box 133, Portland, Ore.

CAMPBELL & GEORGE CO.
379 Brannan St., San Francisco

H. D. EASTERBROOK
1262 S. Boyle
Los Angeles 13, Calif.

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

Canadian Mfr.: N. SLATER CO., LTD., HAMILTON, ONTARIO, CANADA

Export Distributor: INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

THIS TEAM OF WELDER TUBES PULLS A HEAVY PRODUCTION LOAD

...and the team's always on the job, because of fast G-E service when you need replacements!

Left, Thyratron FG-95 Times the welding "shot." Ratings for welder service are: peak anode voltage 1,000 v, peak anode current 30 amp, average anode current 0:5 amp.

Right, Ignitron FG-235-A Opens and closes welder circuit. Max. kva demand 1,200, with avg. anode current 140 amp., with kva demand 400.

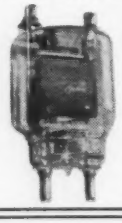
These tubes are silent, long-servicing, need no upkeep—but now and then one has to be replaced. No work can be done until the new tube is installed.

You must have replacement tubes fast. There is a way to get them quickly, and keep production up — because there's a General Electric Supply Corporation warehouse **right in your area.**

The tubes are on hand and you can get immediate service.

FOR INDUSTRIAL HIGH FREQUENCY HEATING APPLICATIONS

GL 833A

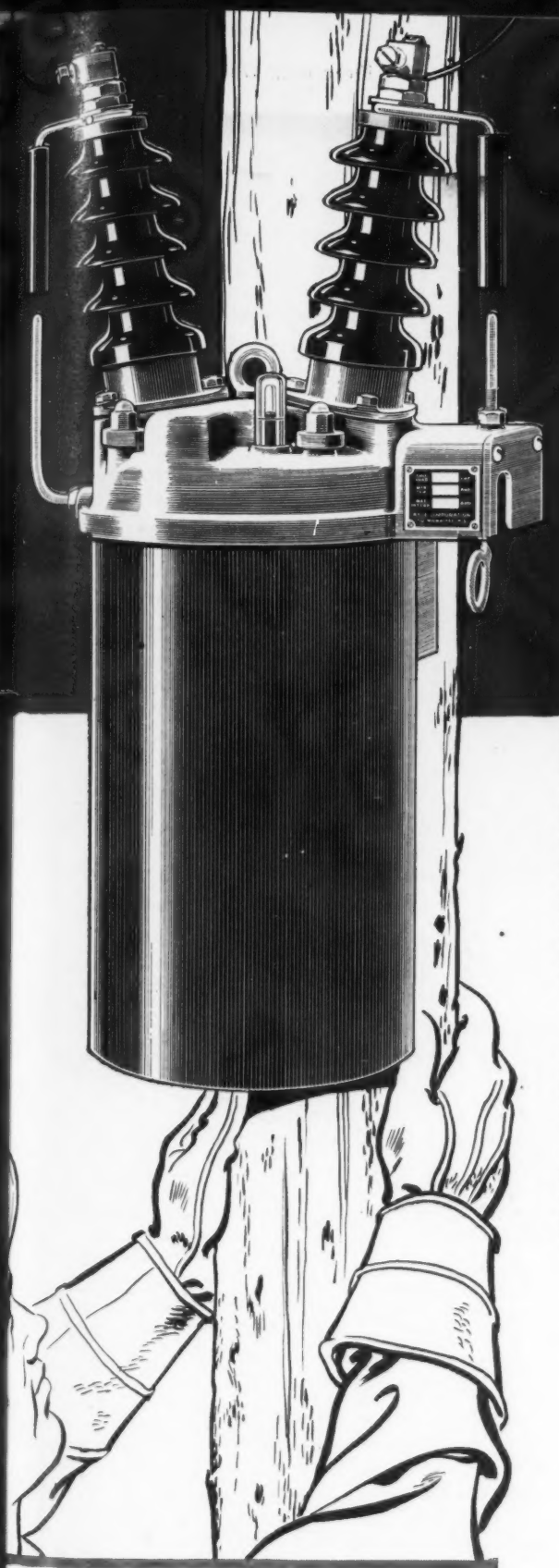


GL 880

LOOK TO THE GENERAL ELECTRIC SUPPLY CORPORATION FOR REAL HELP WITH YOUR TUBE SERVICE PROBLEMS

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE



KYLE OIL CIRCUIT RECLOSERS ARE SAFE 3 WAYS

TO GIVE GREATER PROTECTION TO THE LINEMAN

The Kyle Type "H" Oil Circuit Recloser gives greater protection to the lineman, greater protection to the recloser, and thereby greater protection to your lines and service.

Protection of the lineman is provided by these triple-safe features:

1 **The Head of the Recloser is dead.** The entire top, consisting of the operating handle and cover, contain no live surfaces. The two line terminals are the only "hot" spots.

2 **The Operating Handle is dead.** The operating mechanism is trip-free of the handle. It is impossible for a blow from the mechanism to be imparted to the operator.

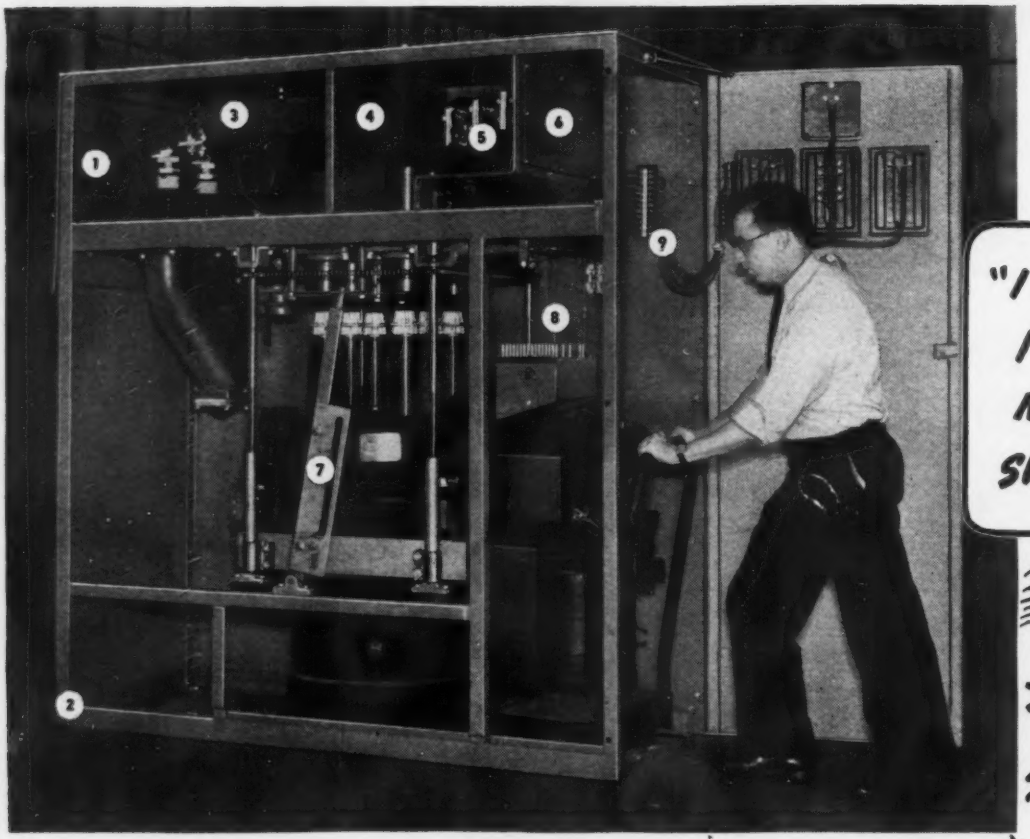
3 **The Tank is dead.** There are no live surfaces on the tank. It is entirely dead and provision is made for grounding. Except for the lead-in bushings AT THE TOP, the entire recloser is dead.

Damage to the recloser from continued overheating under severe overload is impossible with the Kyle Oil Circuit Recloser. A thermo-trip device will automatically lock-out the recloser. Heating is reduced by the use of large coil wire which reduces the IR drop through the recloser. Heat is carried away rapidly by the metal tank. The normal position of the Kyle Oil Circuit Recloser is the safe, open, position. Any mechanical failure opens the recloser. This prevents accidental reclosure and insures complete protection to anyone working on the line.

Ask your Line Material Representative for full information on Kyle Type "H" Oil Circuit Reclosers. Let him show you how they will improve your service to customers . . . earn more revenue for you.

MADE BY KYLE CORPORATION SOUTH MILWAUKEE WISCONSIN

KYLE Circuit Reclosers are Designed and Manufactured for LINE MATERIAL COMPANY



Operators Who Have This Switchgear Like It! Here are 9 Good Reasons Why:

ASK A MAN who has modern Allis-Chalmers switchgear in his plant why he likes it, and chances are that he will give not one, but several of these reasons:

1. Switchgear units are factory-built, wired and assembled. **2.** It's simple to install units, because alignment is needed at just 4 points—not 8! **3.** Changing load is easy—compartments can take current transformers of any size without rebuilding. **4.** Tightly fitted steel barriers separate compartments for buses, instrument transformers, circuit breakers, secondary wiring. For safety, units are isolated from each other!

5. Special method of insulating busbars does away with using compound filling for bus joints. **6.** Removable plates allow easy access to bus and instrument transformer compartments, circuit breakers and secondary wiring. **7.** *Fully automatic* shutters open and close orifices of primary disconnects, when breaker is removed or inserted. **8.** Elevating mechanism has *positive interlocks* which trip circuit breaker if it is in closed position when raised or lowered. **9.** "Hinged" wiring connection between door and stationary element eliminates wear or bending on wires when door is opened and closed.

Get other details about Allis-Chalmers metal-clad, vertical lift switchgear by calling our nearby sales office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2075

"IT HELPS me in selecting equipment to keep in mind the main advantages I'm looking for. With switchgear, my requirements boil down to three points . . .

"FIRST, I want *safety,* for my operators and my equipment. Allis-Chalmers' totally-enclosed switchgear gives me all the safeguards I require . . . including automatic disconnect shutters and positive interlocks.

"NEXT, I want *simple installation.* With Allis-Chalmers switchgear, there are only four *points* to be lined up. I've found these standard, factory-wired units are simpler, quicker to set up in the plant.

"FINALLY, I want *easy maintenance* of breakers and stationary elements. A-C's switchgear scores here, too. It suits me because it offers *all three* of the advantages that mean most to a switchgear operator!"

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

METAL-CLAD *Switchgear*

DON'T BUY SO MANY DIFFERENT TYPES OF CARBON BRUSHES

IT'S A FACT—you don't *need* to buy so many different types and sizes of motor and generator brushes! This has been established by surveys in various plants! A large steel company, for instance, discovered it could cut its brush items from 675 to 93. Another firm eliminated 2285 "necessary" brush sizes and shapes at substantial savings in ordering, billing, and in inventories.

Sponsored by National Carbon Company, Inc., this program of simplification of carbon, graphite, and metal-graphite brush needs can bring similar savings to you.

By making a few simple changes in present brush specifications, a comparatively few standard brush types and sizes will fill most of your varied needs.

HOW BRUSH SIMPLIFICATION PAYS:

1. Price advantage through quantity discounts.

2. Less money and space tied up in brush stocks.

3. Less time needed to handle stock.

4. Reduction of small orders—saving time in bookkeeping, billing, and accounting.

For further facts, get in touch with our nearest Division Office today. Dept. EW.

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation
The word "National" is a registered trade-mark of National Carbon Company, Inc.

UCC

30 East 42nd Street, New York 17, N. Y
Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

BEES IN HIS BALLAST?

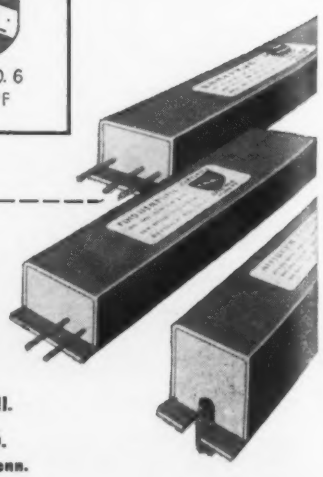
You can prevent it . . . with Certified Ballasts! And here's why:

The hum from fluorescent lamp ballasts can be a pretty annoying thing to a user . . . and before the advent of Certified Ballasts it was often present.

But if properly installed, Certified Ballasts are *quiet.* They have to be, or they wouldn't be *Certified.* This means that these Ballasts are made to rigid specifications set up by foremost lighting engineers. They are tested, checked and *Certified* as meeting the specifications by impartial experts, Electrical Testing Laboratories, Inc. It's this kind of protection that is responsible for not only quiet operation but a dozen other important customer benefits . . . all good reasons why it pays to recommend fixtures that are equipped with Certified Ballasts.

Be sure the ballasts in your lighting equipment bear the famous ETL Certification mark!

CERTIFIED
E·T·L·
SPEC. NO. 6
HIGH PF



Certified Ballast Manufacturers

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

ACME ELECTRIC CORPORATION
Cuba, New York

CHICAGO TRANSFORMER DIVISION
Essex Wire Corporation
3501 Addison St., Chicago, Illinois

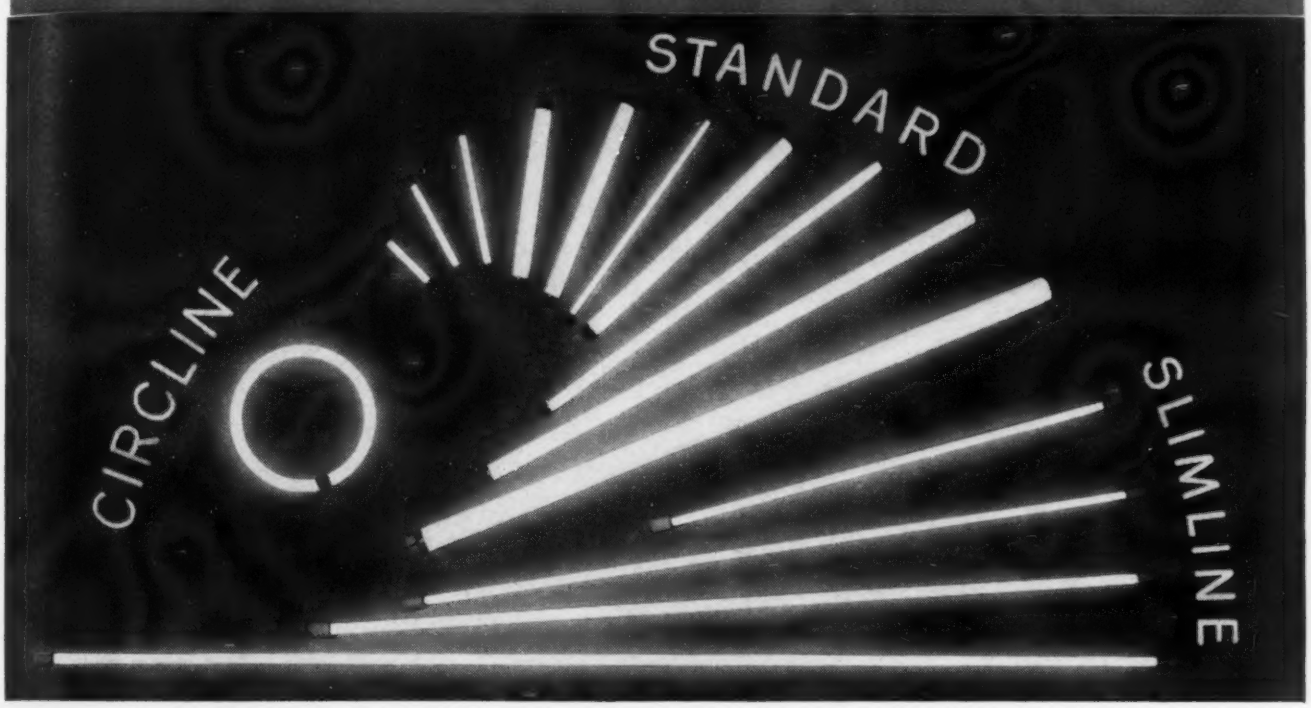
GENERAL ELECTRIC CO.
Speciality Transformer Division
Fort Wayne, Ind.

JEFFERSON ELECTRIC CO.
Bellwood, Illinois

SOLA ELECTRIC CO.
2525 Clybourn Ave., Chicago 14, Ill.

WHEELER INSULATED WIRE CO.
378 Washington Ave., Bridgeport, Conn.

Now! A complete line of G-E Fluorescent Lamps in the popular new 4500 white



No one color of fluorescent light is best for all purposes. But it's significant that since G-E introduced the new 4500 White in 40 and 100-watt lamps a year ago, the popularity of this refreshing color has grown by leaps and bounds. Now, to meet an ever-increasing demand, G-E has placed in production a complete line of 4500 White Fluorescent Lamps, from 6 to 100-watts, including Slimline and Circline

4500 White was developed by General Electric Research to provide a fluorescent lamp with color characteristics between the 3500 White Lamp and the 6500 Daylight Lamp. Here's a happy medium in white lighting . . . cool without being cold . . . near enough to daylight to meet most needs for color discrimination . . . and psychologically pleasing for indoor illumination use.

Before you order new lamps, be sure to see the new 4500 White Call your G-E lamp representative and ask for a demonstration.

G-E LAMPS

Constantly improved by research to

Stay Brighter Longer!

GENERAL ELECTRIC

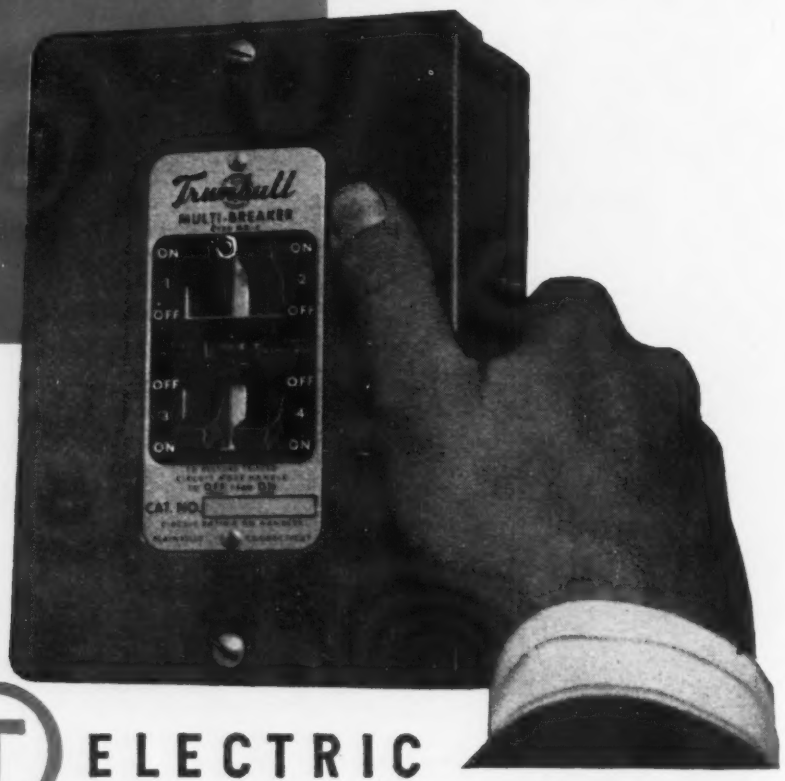
NEW

..TO THE ELECTRICAL INDUSTRY
..IN *Speed* OF TRIPPING
..IN COMPACT..STREAMLINE DESIGN

Magnetic *Plus* Thermal Branch Circuit Protection

Low Cost Circuit Breaker Operation

30 Ampere . . . for New Code Wire Ratings (Nov. 1-1946)



TRUMBULL (T) ELECTRIC

MO-4 MULTIBREAKER

Four Circuits----- or less

Countless thousands of locations require a sentry to guard 4 single phase circuits or less . . . for which duty Trumbull recommends the MO-4 Multibreaker . . . NEW to the Electrical Industry . . . an improvement of the MO-2, tested during war years in million of circuits.

It is low in cost yet has both automatic overcurrent and short circuit protection for branch circuits, in the form of a Circuit Breaker with combined thermal and magnetic characteristics . . . for the greatest speed in tripping.

The MO-4 has a wide range of application in homes, garages, apartments, small stores, and is ideal for camp and farm installations. Specify or order this NEW TRUMBULL MO-4.

IN PRODUCTION NOV. 1 . . . ORDER NOW!

THE TRUMBULL ELECTRIC MANUFACTURING CO. • PLAINVILLE, CONN.

OTHER FACTORIES AT NORWOOD, OHIO • LOS ANGELES • SAN FRANCISCO • SEATTLE

The Case of the INQUIRING LIGHTING SALES MANAGER

Chapter One: HE ASKS FLEUR-O-LIER SOME POINTED QUESTIONS

what are certified FLEUR-O-LIERS?

FLEUR-O-LIERS are fluorescent lighting fixtures made to exacting specifications, set up by lighting experts, for performance, construction and service.

what do you mean, "CERTIFIED"?

Fixtures built to the FLEUR-O-LIER specifications are submitted for testing and checking to independent experts, Electrical Testing Laboratories, Inc. If the fixtures meet all rigid specifications, they are permitted to bear the ETL CERTIFICATION LABEL, shown below.

Is FLEUR-O-LIER the brand name of <u>one</u> company?

Not at all! 27 leading fixture manufacturers participate in the FLEUR-O-LIER CERTIFICATION program at the present time, and the number is growing.

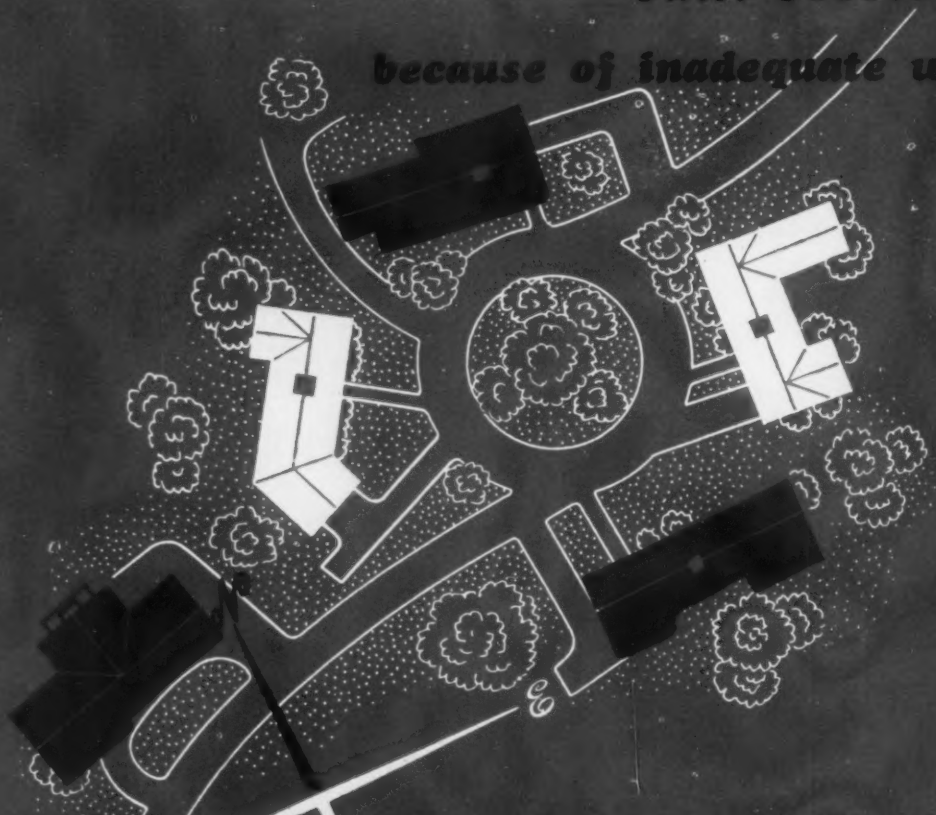
this label is your clue to good lighting fixtures!

It is your definite assurance of *electrical, mechanical and lighting excellence* in fluorescent lighting fixtures!

FLEUR·O·LIER *Manufacturers*

Fleur-O-Lier is not the name of an individual manufacturer, but of a group of more than 30 leading fixture manufacturers. Participation in the FLEUR-O-LIER MANUFACTURERS' program is open to any manufacturer who complies with FLEUR-O-LIER requirements.

WARNING with 3 out of 5 be built obsolete because of inadequate wiring?



AN IMPORTANT MESSAGE TO ELECTRICAL CONTRACTORS

Right now, you have a great opportunity to help solve the housing problem *soundly* — and to do so with well-justified benefit to your business. It's like writing yourself an order for more jobs.

Americans need homes built for *modern living*, yet many of the modern-looking homes now proposed will be *obsolete when built*, because the *wiring plan* is not suited to electrical requirements.

Your help is needed to give *adequate wiring* the importance it deserves . . . to impress householders, architects, and builders alike, with the gains in *livability* and *salability* that come with a careful layout of high-capacity circuits to meet tomorrow's electrical needs. Planners and builders of industrial and commercial buildings, too, should be shown the valuable advantages of adequate wiring.

In this effort, you can count on G.E. to team up with you. We are offering, in national, architectural, building, and industrial advertising, booklets and wiring guides that sell *adequate wiring*, and stress *your part* in doing it right. This material can help you, too.

Keep in touch with your local G-E Merchandise Distributor. He'll keep you informed and equipped with G-E ammunition to get more new buildings more effectively wired. Ask him for literature on any part of the full G. E. line. Or, write to Section AW 6-1018, Appliance and Merchandise Department, General Electric Company, Bridgeport 2, Connecticut.

GENERAL ELECTRIC

MONARCH'S "SIDE-HEET" COOKER

WRAPS THE HEAT AROUND THE MEAT

When you talk "deep well" cookers, remember there's a vast difference between bottom heat and side heat.

With Monarch's exclusive "Deep-Heet" Cookers, the heat is wrapped around the food. Area of heat application is more than 4 times greater. The result is oven-type heat which bakes, not stews. Meats are more tender, tastier, cook faster. Chicken, golden-brown, falls off the bone. Foods do not stick to bottom — stirring is unnecessary.

It's the side heat that makes the big difference — one of the many exclusive Monarch features that enable Monarch dealers to look with confident optimism into the competitive days to come.

MALLEABLE IRON RANGE CO. 3906 Lake St., Beaver Dam, Wis.

Sauerkraut and spareribs respond to Monarch "side-heet" in a way that gives this stand-by American dish a new mouth-watering appeal.

A 2½ lb. whole chicken, or 5 lbs.of jointed chicken, can be dry roasted to a tender, even brown.

If baked pork chops are on the menu, here is a clever way to cook them — a natural for "side-heet."

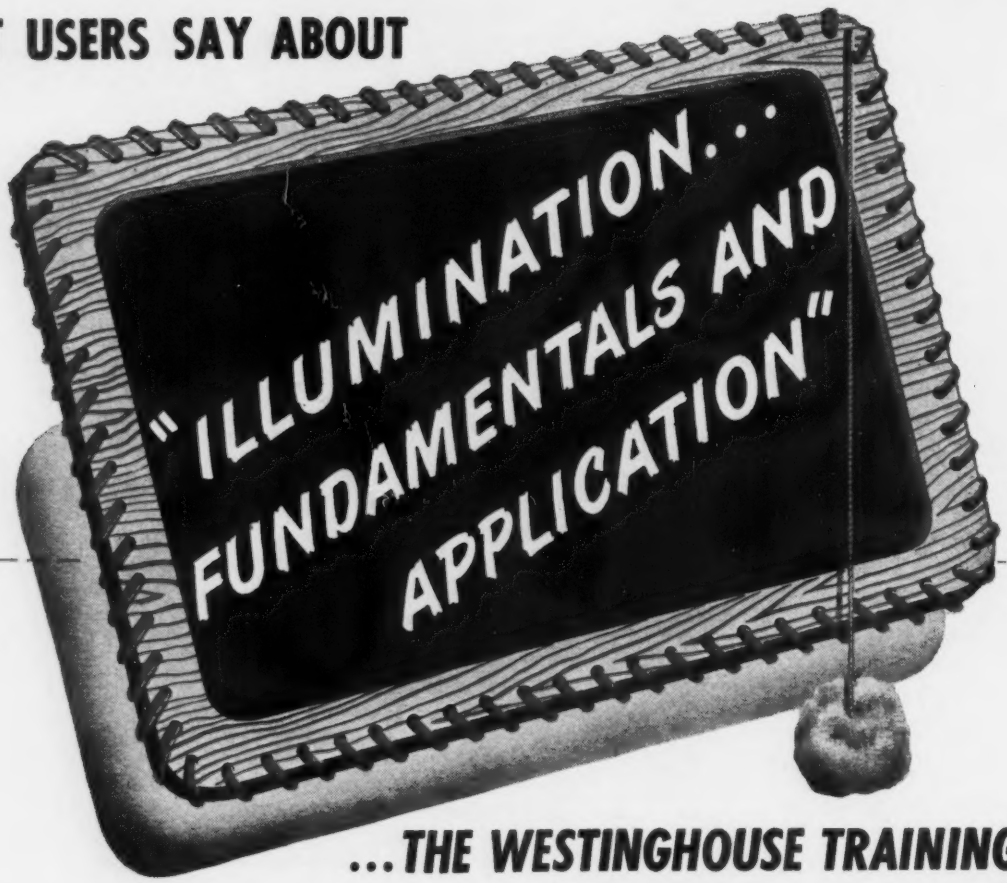
Yes, it even bakes an angel food cake — just the right size for one meal. And is it delicious!

RANGES AND HEATERS

Monarch - Paramount

COAL · WOOD · ELECTRIC · GAS and COMBINATION RANGES

WHAT USERS SAY ABOUT



...THE WESTINGHOUSE TRAINING COURSE FOR LIGHTING SALES PERSONNEL

SOUTHERN CALIFORNIA EDISON COMPANY LTD.
"... this is the best approach to the lighting training problem I have had the privilege of seeing to date, and I recommend your course very highly to anyone faced with the problem of training a lighting sales staff."
—G. M. RANKIN, *Director of Lighting*

THE DETROIT EDISON COMPANY
"We feel that it is one of the finest contributions to the problem of training that has yet been produced."
—L. E. TAYLER, *Senior Engineer, Lighting Div.*

BIRMINGHAM ELECTRIC COMPANY
"... your eighteen Sound-Slide Film lessons ... proved to be an excellent course and the praise from our salesmen, both old and new, was instantaneous and constant."
—LUTHER T. CALE, *Commerical Sales Manager*

THE CINCINNATI GAS & ELECTRIC COMPANY
"We have used the Westinghouse Lighting Course and not only find it extremely valuable as a basis for training some of our inexperienced Lighting Engineers but found it very well received by our Lighting Engineers who have had many years experience in the Lighting field. We recommend this course very highly."
—A. J. RUTTERER, *Supervisor, Lighting Div.*

WEST PENN POWER COMPANY
"... former employees for whom the course was a 'refresher' ... remarked how well it screened the wide field of current lighting data to emphasize the essential points and bring them up to date quickly ... The new men found the 'Fundamentals' a logical introduction into a branch of engineering with which they were unacquainted, and they made surprisingly rapid progress."
—HARRY RESTOFSKI, *Sales Promotion Manager*

WHAT IS THIS COURSE?

It is designed specifically for lighting sales personnel of electric-service companies. The content was determined by asking electric-service companies what they needed and wanted. Users are charged $225 for a set of course materials:

18 sound slide films · 10 sets of 18 lesson books each
1 instruction manual · 1 lighting handbook

HOW DO YOU GET IT?

Call or write to your nearest Westinghouse representative, or write direct to Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J. For more information, ask for "Illumination ... Fundamentals and Application," Form A-4809—a descriptive sheet explaining the lighting course.

Westinghouse *LAMPS FOR SEE-ABILITY*

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ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

October
1946
©

Worst thing about the outlook for appliances is the well-known blues. Production isn't bad, considering, and deliveries have been trickling along. But the gloom is plenty heavy. It's the uncertainty of everything, probably— supplies of metals and materials, labor demands bubbling up all over again, OPA price adjustments and the arguing that has to be done over each one, the stock market dip which has made banks tight with money the manufacturers need— all contribute to uncertainty.

The blues

Best advice is to make the best of it for the Christmas trade again, piecing out with gifts and gadgets. There will be irons aplenty, even if not all known brands; same goes for table model radios and phonographs; records are in good supply; heat and sun lamps and heating pads, even electric blankets.

Xmas prospect

Make those of your customers who do get one of the major appliances realize that it's really a wonderful Christmas break for them. A smart merchant makes even tough times go to work for him.

Never down

Thor's new factory at El Monte was opened with appropriate ceremony Sept. 25, and is gradually getting up to speed, turning out Automagics. Next month's issue will give a detailed story.

Starts

There'll be a first-hand report on things at the factories and in the East, too, from a couple of keen-eyed observers, J. Clark Chamberlain of San Diego and Victor Hartley, of PCEA, both of whom will return from the meeting of League managers in N.Y.

Low-down

Christmas tree lamps will be slightly more plentiful but not enough to fill the demand, lamp men tell us. About 50% of the expected demand only can be filled, by all makes.

Twinkle

Word is that Don Lee plans to build a million-dollar television station on top of Mt. Tamalpais, north of San Francisco, for operation by next June.

Bay video

Union Ice Co., not to slip from the ice business it has regained during the war shortage of electric refrigerators, has worked up an attractive booklet and will hit the old theme, "it doesn't dry out".

But drips

Hyflux, a metalic-coated paper tape, is being developed by Indiana Steel Products Co. for use as a recording media. Also being developed are recorders which will use the magnetic paper tape. The stuff has promise of low cost operation. — Paper recording

F. L. Jacobs Co. of Detroit, maker of the Launderall, has joined with the Radiant Heater Corp. of New York to form a new Infralectric Radiant Heater Corp. Infralectric will handle the sales of this glass-grid electric home heating unit. A new portable combination heating unit and tray will be distributed through Launderall distributors. Jacobs will manufacture both units. Offices will all be in Detroit. — Hot tie-up

Cory, in a regional sales meeting in Los Angeles, told its distributors that it would promote heavily its new rubberless coffee brewer, using a glass-to-glass seal. It will come in two sizes, two-to-four and four-to-six cup. New display pieces will call attention to this feature. — No more rubber

Toastmaster recently had its sales managers in for a meeting at Max McGraw's farm to lay out plans for selling into 1947. Rusty at selling, used only to telling people "Sorry," they were put through a refresher to "Show 'em, tell 'em, sell 'em." New display piece announced is designed to do that, with or without a live sample in it. — Brush up on selling

A National Cooperative Congress met at Columbus, Ohio, early in September to further plans to make your tax-free competitors, the Co-ops, grow faster. — Tip

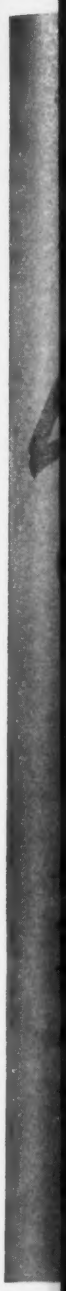
Puritan Dry Rug Shampoo powder, which is used in connection with a vacuum cleaner, makes a fine accessory for appliance dealers. Made in Atlanta, it comes in case lots, with one free for demonstrating in each 24. — Rug drug

A way to trap and kill insects is incorporated in a new DDT Lite, made in Los Angeles. A cage of flocking, impregnated with 100% DDT crystals, surrounds a light globe. The light attracts the insects, the DDT kills them. — Bug trap

Frigidaire has a new up-to-the-minute accounting system for its dealers which promises closer financial control, greater flexibility and more advanced procedure to tell just where they stand. It is completely revised from the former system to include handling of other lines of merchandise along with appliances, used and repossessed products, service, etc. — Revamp accounts

Vacuum cleaner and floor covering manufacturers are going to have an inter-industry research committee to study both rugs and cleaners and recommend improvements to both. High pile carpets and lighter colors present some problems to the vacuum cleaner, but without a cleaner, light colors never could be used successfully. — Related

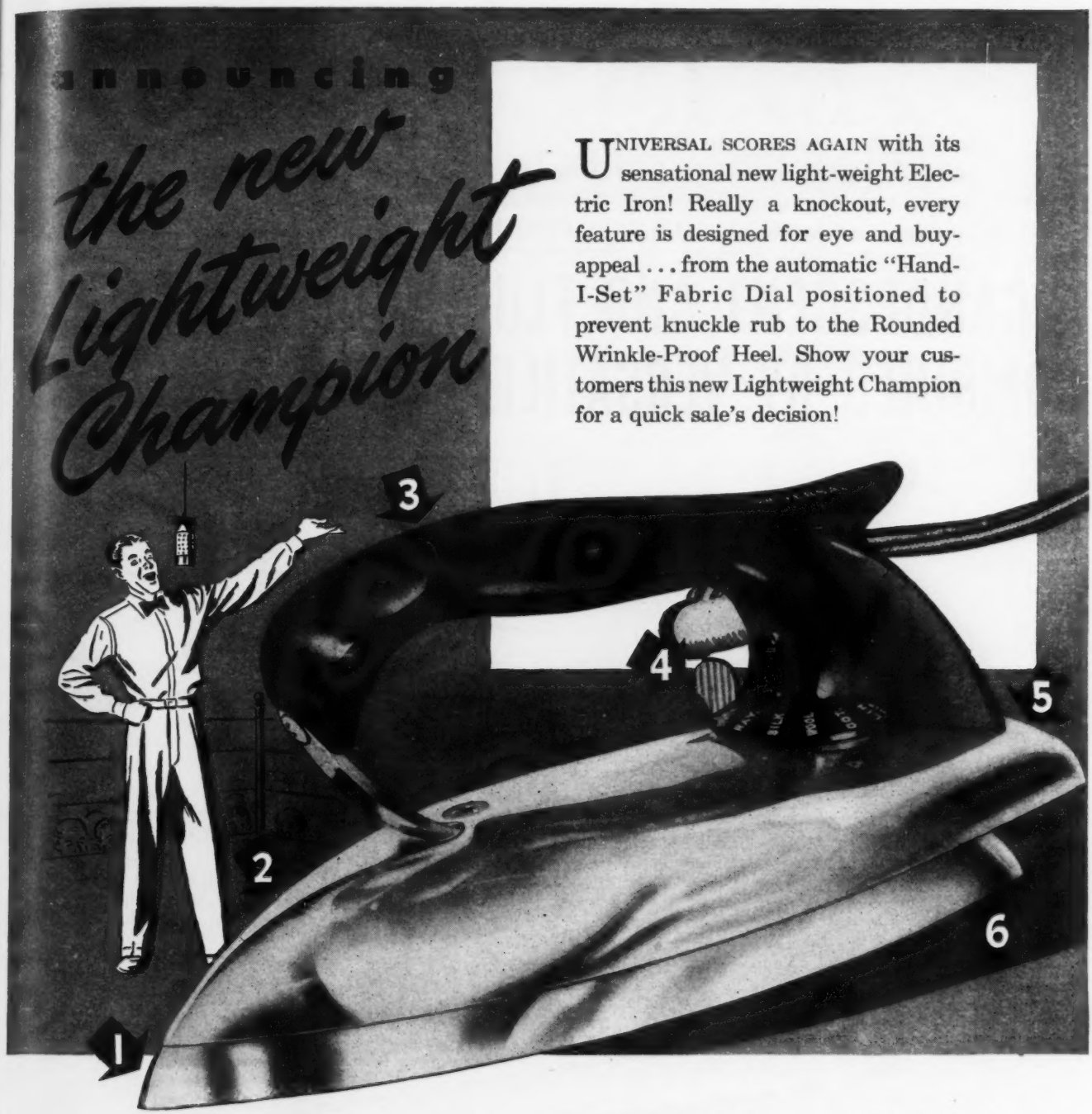
Despite the soap shortage, Lever Bros., the big soap manufacturer, has begun a nationwide promotion of washing machines. Grocers everywhere will be displaying signs saying that "New washers are coming" and there will be booklets to tell "How to choose and use your new washer." — Rinso's bright



announcing

the new Lightweight Champion

UNIVERSAL SCORES AGAIN with its sensational new light-weight Electric Iron! Really a knockout, every feature is designed for eye and buy-appeal . . . from the automatic "Hand-I-Set" Fabric Dial positioned to prevent knuckle rub to the Rounded Wrinkle-Proof Heel. Show your customers this new Lightweight Champion for a quick sale's decision!



WINNING FEATURES OF THE UNIVERSAL LIGHTWEIGHT IRON

1. BEVELED POINT FOR UNDER-BUTTON IRONING
2. LUSTROUS CHROMIUM SURFACE
3. COOL PLASTIC HANDLE
4. HAND-I-SET FABRIC DIAL
5. ONE-PIECE SOLID HEEL REST
6. ROUNDED WRINKLE-PROOF HEEL

UNIVERSAL

LANDERS, FRARY & CLARK • NEW BRITAIN, CONN.

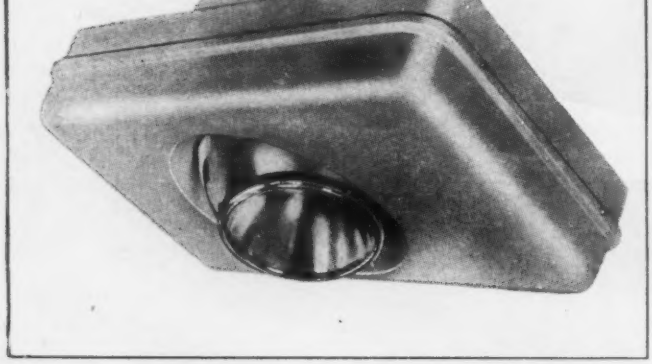
Universal Electrical Appliances distributed in Canada exclusively by Northern Electric Company, Ltd.

LEADERSHIP THAT BUILDS YOUR DEALERSHIP!

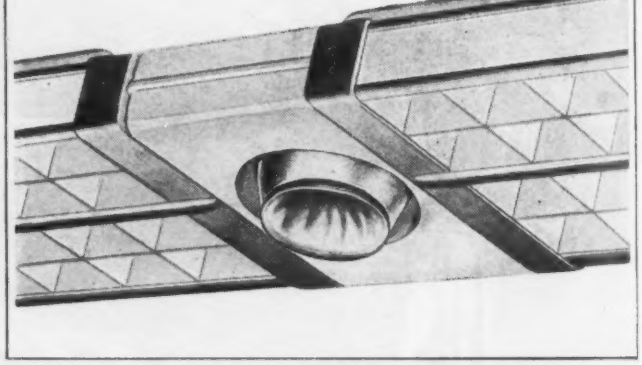
SYLVANIA NEWS
CENTRAL STATION EDITION

OCTOBER *Prepared by* SYLVANIA ELECTRIC PRODUCTS INC., Salem, Mass. 1946

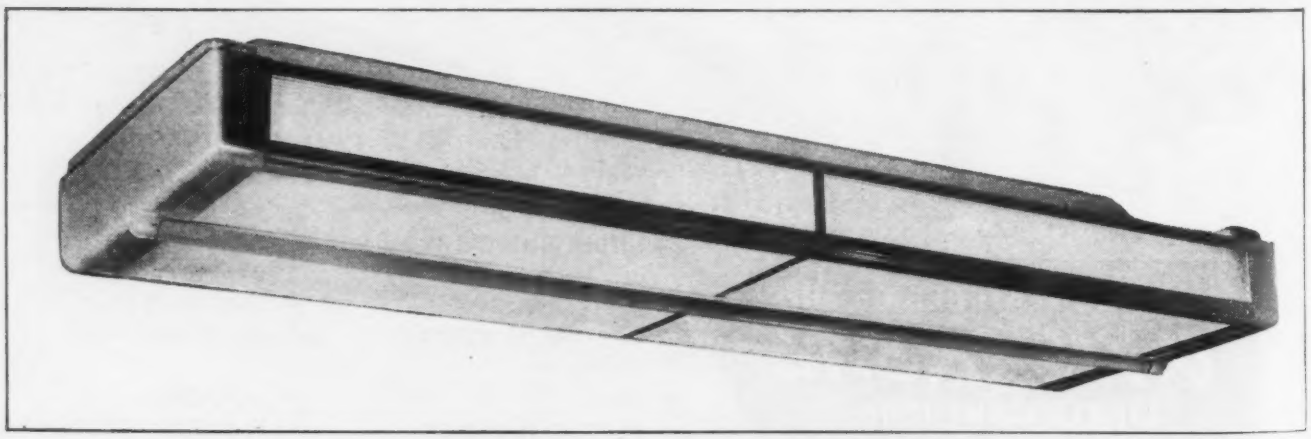
INCANDESCENT AND FLUORESCENT LIGHTING COMBINED BY VERSATILE SYLVANIA FIXTURES



Here is the new Sylvania CP-150 adjustable incandescent spotlight. This powerful unit will find wide use in stores, theatres, entrances, window displays—for focusing attention where it is wanted. CP-150 can also be joined with fluorescent fixtures to form a combination lighting unit.



The CP-150 spotlight is shown joined with two Sylvania CL-440 fluorescent fixtures—all three being members of the same "design family." Provides accent lighting plus general illumination. (The CP-150 can also be turned to its narrow side and centered between fixtures of *two* 40-watt lamps each.)



This is the Sylvania CG-440—glass shielded version of the CL-440 fixture (above right). Containing four 40-watt fluorescent lamps, this fixture has the beauty and modern appearance required by the most exclusive shops and offices.

These new fixtures are examples of Sylvania's pioneering in new and improved lighting equipment. With the cooperation of public utilities, this work has been bringing more and better light to an ever increasing number of users.

SYLVANIA ELECTRIC

MAKERS OF FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS; RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES

Frigidaire operates world's largest porcelain finishing plant for appliances!

FRIGIDAIRE was first to apply a porcelain finish successfully to household refrigerators, nearly a quarter-century ago. Since then, the finishing process and the porcelain itself have been steadily improved until the porcelain on Frigidaire appliances of today is world famous. Time, heat, water, paint, fire, scuffing—none of these will harm Frigidaire Lifetime Porcelain.

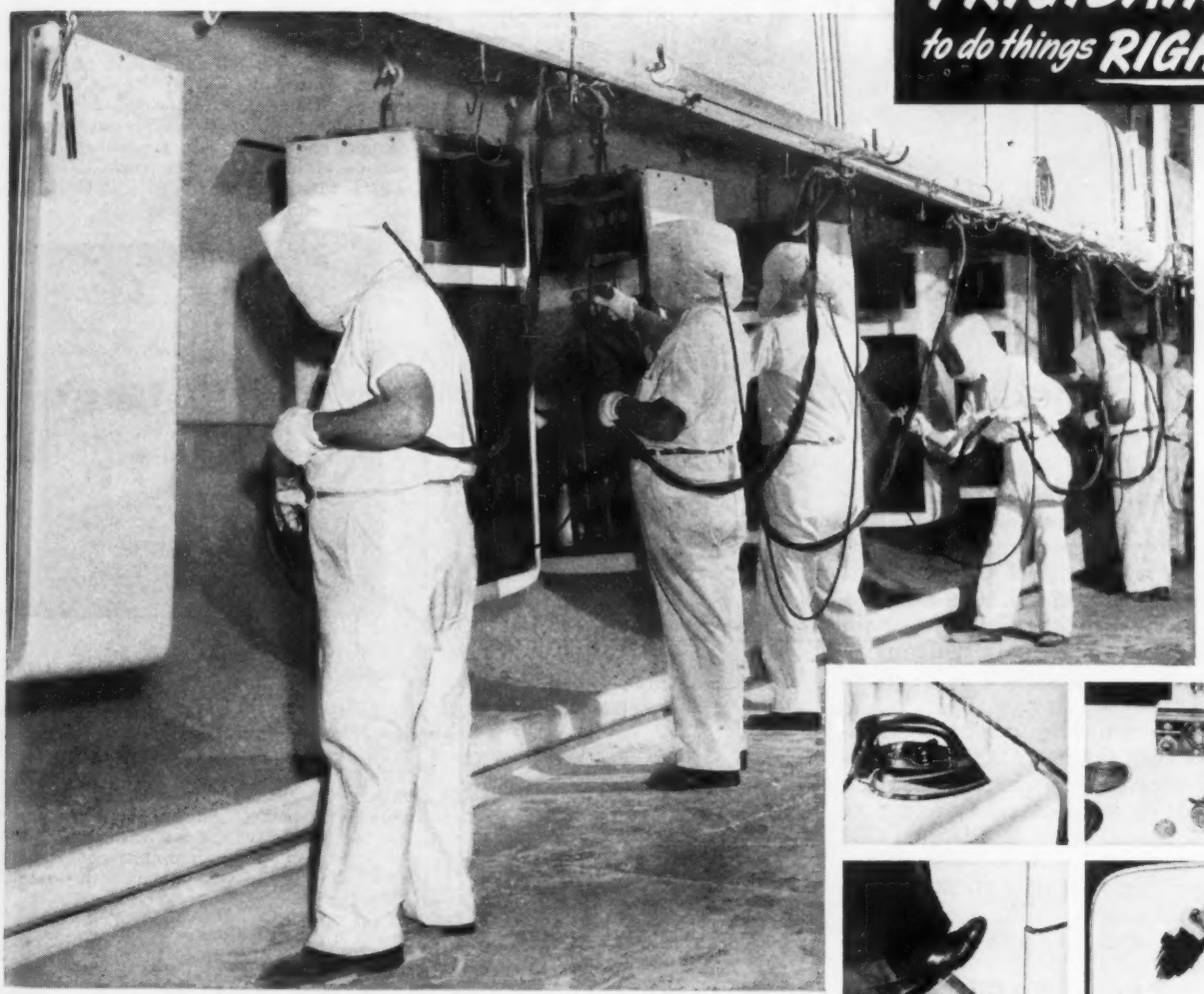
Yet Frigidaire Lifetime Porcelain, while being the finest obtainable, is not a high-premium product!

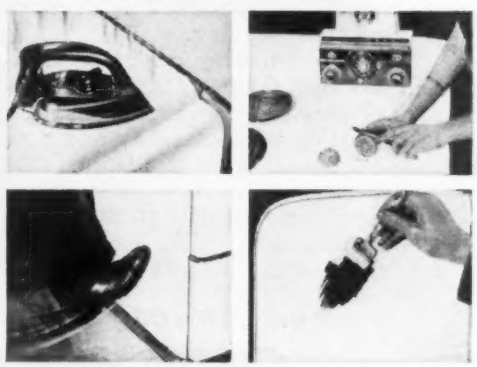
By modern methods of production; by continued improvement; by steady increases in economy of manufacture, Frigidaire has put this finest of all appliance finishes within reach of millions of home-owners. And Frigidaire has probably produced more porcelain-finished refrigerators than all other manufacturers combined!

This has meant added enjoyment and satisfaction to purchasers, a higher unit of sale and increased profits to Frigidaire dealers.

Here then — in this world's-largest porcelain-finishing plant — is another example of Frigidaire leadership. Another reason why the Frigidaire franchise is more eagerly sought and more jealously guarded than any other in the industry. Another proof that the Frigidaire dealer and his customers can—

Depend on FRIGIDAIRE to do things RIGHT!





Proof of the enduring finish of Frigidaire Lifetime Porcelain is shown in actual tests with excessive heat, lemon juice, scuffing, and paint. Years of experience have proved how well Frigidaire Lifetime Porcelain stands up under such treatment.

You're twice as sure with two great names

FRIGIDAIRE

made only by GENERAL MOTORS

Fit all Ranges . . . Installed in a Jiffy!

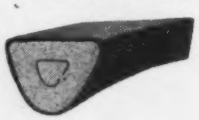
★ *Fast*
★ *Easy to Clean*
★ *Economical*
★ *Long Life*

There's more profit and faster turnover when you handle CHROMALOX *Triangular* Range Units. Two unit sizes and a supply of CHROMALOX Adaptor Rings are all you need to assure perfect fit in *all* range openings. This means—smaller inventory . . . quicker installation . . . more service calls per day.

You are building customer-goodwill too with CHROMALOX *Triangulars.* Women everywhere praise the fast cooking, easy cleaning and economical operation of this Unit.

Get next to the sales-building, profit-getting CHROMALOX Range Unit Replacement line. Write today for Bulletins CF-145 and L-1023A.

Exclusive Chromalox Design for Better Cooking!



Cutaway shows flatter, wider *Inconel* sheaths. *Inconel* is rugged, tough, rustproof and acid-proof.

on new ranges and for replacement

CHROMALOX

means *Electric* Cooking at Its Best!

RC-18

EDWIN L. WIEGAND COMPANY • 7540 THOMAS BOULEVARD • PITTSBURGH 8, PA.
SAN FRANCISCO 3, CALIF., Montgomery Bros., 1122 Howard Street; LOS ANGELES 21, CALIF., Montgomery Bros., 741 E. Eighth St.; SEATTLE 4, WASH., Montgomery Bros., 911 Western Ave.; DENVER 2, COLO., The Peterson Co., 1921 Blake St.; PORTLAND 9, OREGON, Montgomery Bros., 1104 N.W. 15th St.

PRODUCTS

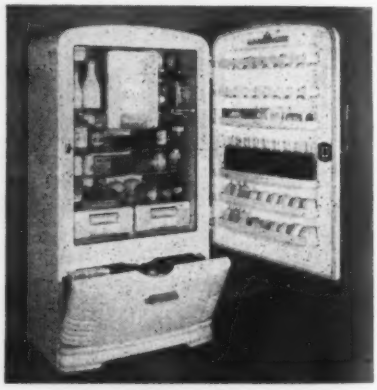
that are news

Frozen Food Cabinets (1000)

York Corp. is making two frozen food cabinet models for hotels, restaurants, hospitals, smaller commercial establishments and farms. A 33-cu. ft. model will hold up to 1,300 lb. and a 16½-cu. ft. model will hold approximately 600 lb. Although designed primarily for storage, both models are equipped with quick-freezing compartments. The larger unit is an upright model with front opening doors, has condensing unit and controls on top. It is powered by a ½-hp. motor. A warning bell rings when the storage temperature goes above the recommended range, and a pilot light goes off if the power supply is broken. The smaller model has a 1/3-hp. condensing unit, two access lids, movable partitions in the storage compartment.

Refrigerator (1001)

Crosley's 1946 9-ft. Shelvador refrigerator has shelf area of 19.14 sq. ft., six aluminum shelves in the door, improved Electrosaver unit, storage bin, two slide-out vegetable crispers and a porcelain meat chest. Twelve pounds of ice, 112 cubes, may be made at one freezing. The unit is 63¾ in. high, 33½ in. wide and 22¾ in. deep.



Home Freezer (1002)

Model VHF-7 is an addition to the Norge home freezer line. It is a 6.82-cu. ft. kitchen type freezer with six compartments, each with a separate door. It will hold approximately 240 lb. of frozen food. Interior is porcelain enamel, exterior Norgloss finish. All freezer shelves are refrigerated. An etched space on each aluminum compartment door can be written upon with erasable china pencil.

Water Heater (1003)

For small homes and business places, Acme Laboratory Equipment Co. is offering the Elite, a 2-gal. automatic electric water heater of the non-pressure type. It may be installed over sink or washstand by means of a pipe connection to the cold water supply and may be plugged into any 110-volt a-c circuit. The cabinet is stainless steel, is 12 in. wide and 16 in. high, projects 7 in. from wall when mounted. The unit has a built-in snap electric switch and a neon pilot light. It is thermostatically controlled, has fiber glass insulation.

NOW . . .

YOU CAN MAKE NEW FRIENDS

WHEN YOU OFFER BOTH

PVX* *the new G-E nonmetallic sheathed cable*

G-E THERMOPLASTIC* *building wire*

General Electric's new PVX nonmetallic sheathed cable is an added selling tool for you. When you offer *both* PVX and G-E Thermoplastic, Types T and TW building wire, it means better service for your customers and new friends for you.

G-E Thermoplastic building wire and PVX cable can be used for both open and concealed work in residential and commercial buildings. They have many advantages that contribute to easy installation, great resistance to hazards encountered in service, and long life. Check these features today — and start building for tomorrow's bigger sales.

PVX

PVX is a new high-quality, lightweight, small diameter cable assembly that can be installed quickly and easily, and will give long service. Insulation of the G-E Thermoplastic Type T wires is a thermoplastic compound, high in dielectric and mechanical strength, and resistant to oil, acids, and alkalies. The conductors are protected with an improved crushed-paper armor, and are covered with a tough over-all braid. Both insulation and over-all braid are flame and moisture resistant. The whole assembly can be freely stripped. Available with two or three conductors in sizes 14 to 4.

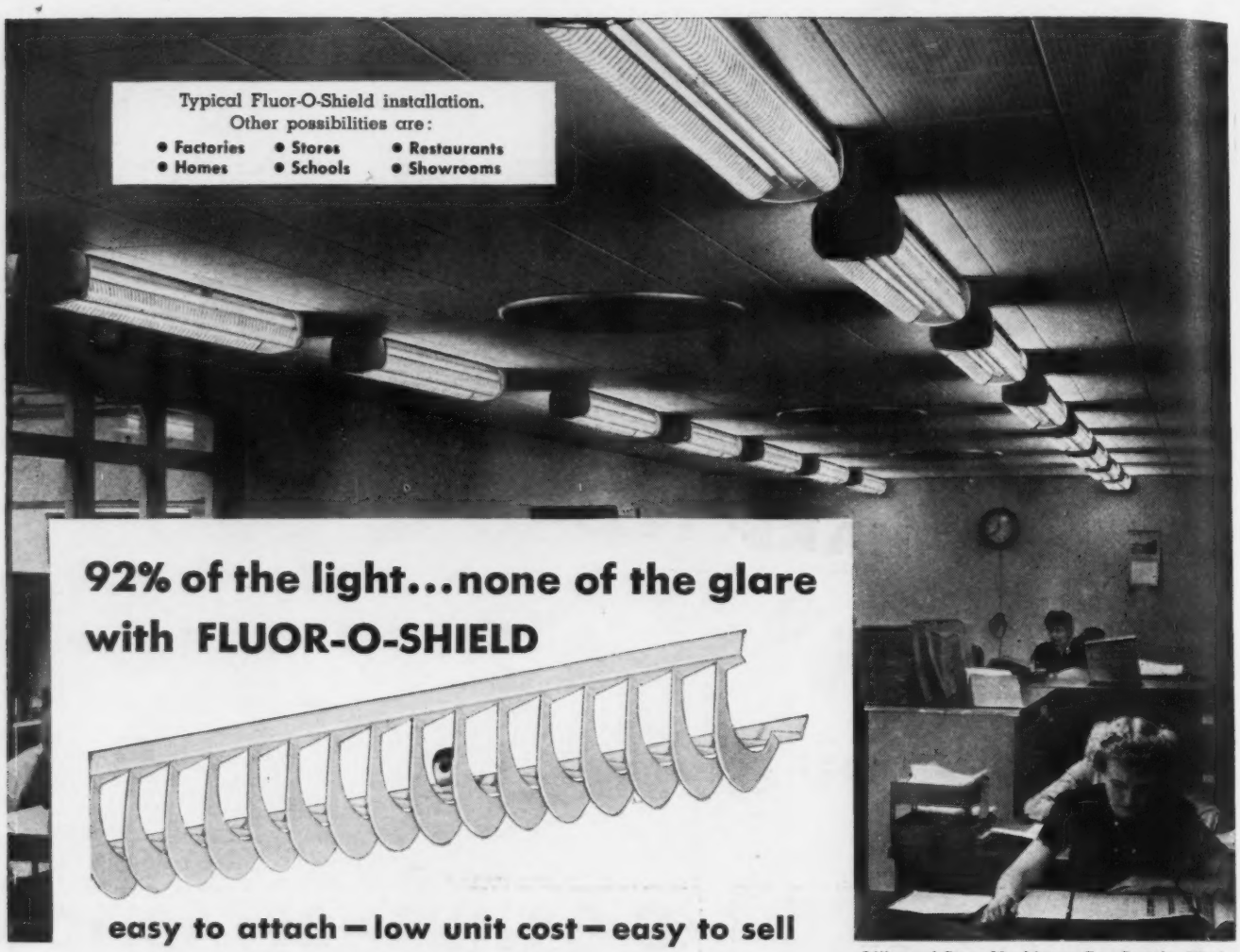
Types T and TW Thermoplastic Building Wire

This small diameter, high-quality building wire is available in sizes No. 14 to 2,000,000 CM. It is ideal for new wiring, rewiring, and maintenance wiring. It is easy to pull in conduits, and can be stripped quickly. The insulation of both Types T and TW has long life, is high in dielectric and mechanical strength, and is resistant to oils, acids, and alkalies. Type TW is especially recommended for wiring in wet locations.

For further information, write to Section W13-1018, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

*Trade-mark Reg. U. S. Pat. Off.

GENERAL ELECTRIC



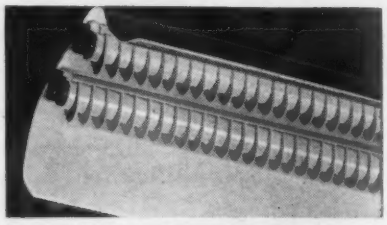
92% of the light...none of the glare with FLUOR-O-SHIELD

easy to attach—low unit cost—easy to sell

Multiple sales of Fluor-O-Shields are turning in quick profits for dealers and contractors all over the country. Here's the reason: the numerous advantages of Fluor-O-Shields can be demonstrated right at the point of use without expensive sales technique. Endorsed by lighting engineers, lamp tube manufacturers, and electrical testing laboratories, Fluor-O-Shields give *92% of the light* of bare fluorescent lamps, with none of the glare. This results in better lighting for better working conditions, more working efficiency. Lightweight, ease of attachment and all-around efficiency make Fluor-O-Shield the most practical light diffuser on the market. If your distributor does not stock Fluor-O-Shields, write for name of our distributor, or ask your distributor to write us.

- **Fit most exposed lamp fluorescent fixtures.**
- **Simply snap on or off lamp tubes—instantly attached or removed without bolts, screws or tools.**
- **No strain on lamps or sockets. 1-piece, light-weight aluminum, finished in white baked enamel.**
- **No soldered connections to break or pull loose. No horizontal surfaces to collect dust or dirt.**
- **Modernize and improve appearance of exposed lamp fixtures at surprisingly low cost.**
- **Low stock investment, convenient to stock, packed nested to take little space, move out rapidly.**
- **Combination sales item along with fluorescent lamp tubes and starter replacements.**
- **Available in two sizes for 20W and 40W lamps. Shipped ready for immediate attachment.**

Offices of Starr Machinery Co., Seattle, Wash.



Fluor-O-Shields fit most exposed lamp fixtures. Eliminate glare, eyestrain, stroboscopic effect.

Snap-on clips provide instant attachment or removal without bolts, screws or tools. Burned out lamps changed quickly and easily.

$1.95 40 watt 46⅞ in.

$1.25 20 watt 22⅞ in.

FLUOR-O-SHIELD*

Light Diffuser for Fluorescent Lamps

Represented Nationally by
D. E. SANFORD CO.
NEW YORK • BOSTON • PHILADELPHIA
ATLANTA • CLEVELAND • CHICAGO
ST. LOUIS • SAN FRANCISCO
LOS ANGELES • DALLAS • SEATTLE

*Trade Mark—Patent Pending

FLUOR-O-SHIELD* by CAMFIELD MANUFACTURING COMPANY • GRAND HAVEN, MICHIGAN

AND NOW...

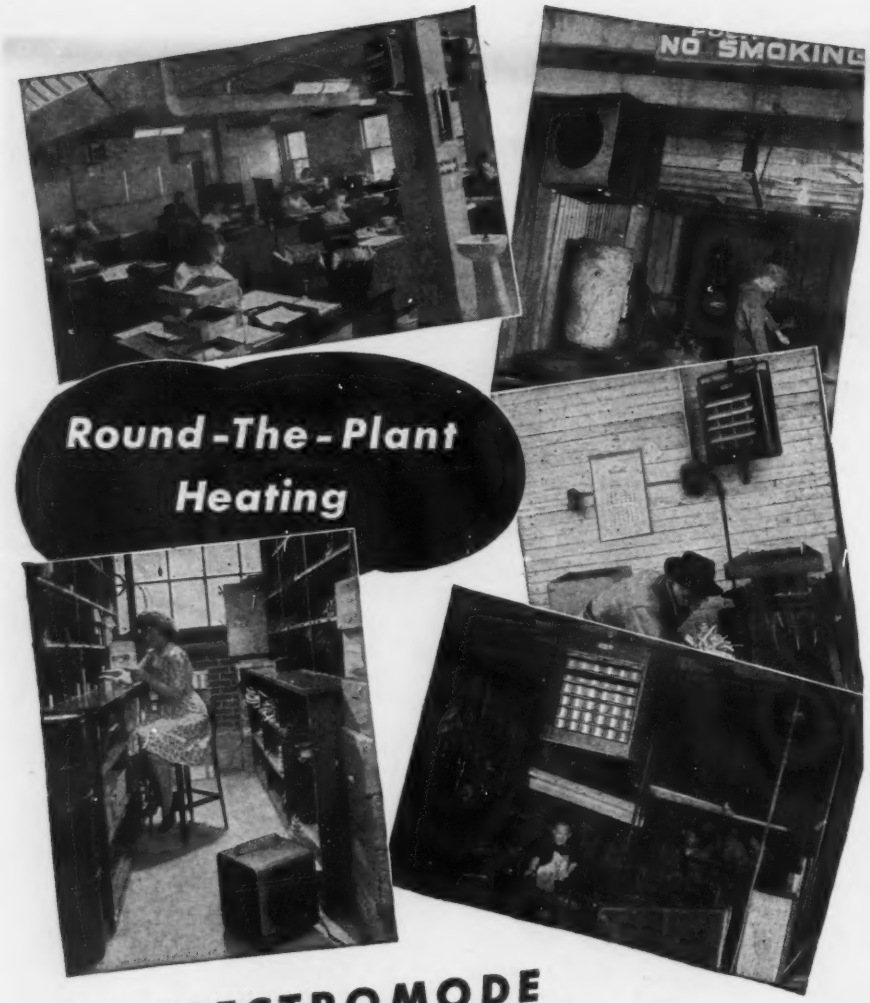
Railley ADDS NATIONAL ADVERTISING

More Light in your life
The American Home
ELECTRICITY ON THE FARM Magazine
The Family Circle
GOOD HOUSEKEEPING
Better Homes and Gardens
House & Garden
House Beautiful
Journal
PARENTS' MAGAZINE
Woman's Day
PIN UP A PIN-IT-UP* LAMP WHEREVER YOU NEED MORE LIGHT
Add a bright note to dark corners with these handy, handsome lamps ...and get generous light over chairs, desks, bed, dresser, dinette ... anywhere from front hall to back stairway. Just hang it up like a picture, safely out of the way of active toddlers. This French design with the durable, washable Plastisilk shade is just one of many smart styles for every room.
NOW YOU CAN MOUNT LAMPS WHERE THEY BELONG
Allow 55" from top of shade to floor, for balanced appearance and eye-comfort. Pin-It-Ups go this low because the new exclusive No-Glare Light Saver on the reflector bowl cuts upward glare, casts more sight-saving, glareless light downward.
YOU CAN FIND THE SWITCH IN THE DARK
No stumbling or fumbling! Luminous Glo-Switch, within easy reach at base of ivory Plasti-Socket, glows in the dark.
At leading stores everywhere
Railley CORPORATION Cleveland 8, Ohio
ORIGINATORS OF THE PIN-IT-UP LAMP
*Reg. U.S. Pat. Off.

You've been hearing about the many exciting new developments in Railley Pin-It-Up* and Table Lamps. Now all America is going to hear about them, too—with an extensive magazine advertising campaign starting with October issues... reaching 29,992,286 readers. This long range advertising program is designed to build consumer recognition of Railley lamps, with an eye to the not-so-far-distant future when merchandise will again be *sold* instead of *bought*.

Railley
CORPORATION · CLEVELAND, OHIO
ORIGINATORS OF THE
PIN-IT-UP LAMP*
TRADE MARK REG. U. S. PAT. OFF.

RAILLEY CORPORATION • CLEVELAND 8, OHIO



with ELECTROMODE UNIT HEATERS

Heat—anywhere in the plant—in factory, stockroom, office, warehouse, is possible with the installation of Electromodes. Wherever circuit wires can be run,—to isolated buildings, or beyond central heating system range,—Electromodes can furnish clean, safe, heat economically.

For local or supplementary heat when some departments are running overtime, for week-ends, holidays and inventory periods, Electromodes save on heating costs. There is no heat-loss en route from wires to heater. No current is used when not "on."

Cut-away view of exclusive Electromode Finned Heating Element as used for years to heat U. S. Submarines. No fire, shock or explosion hazards.

Long-life service, free from fire, shock or explosion hazards, is another Electromode advantage. The patented heating element is insulated, sheathed and embedded in a one-piece finned aluminum casting. There are no exposed hot wires or glow elements. Standard capacities, 1.5 KW to 60 KW. Ask your Electrical Wholesaler to recommend appropriate sizes.

ELECTROMODE CORPORATION, Rochester 3, New York.

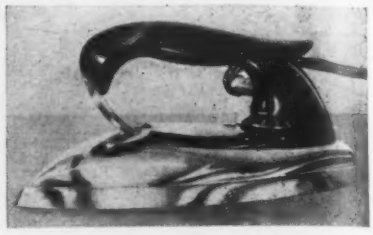
ELECTROMODE
Electric Unit Heaters

Send for latest Bulletin 45-U and Heating Analysis Form.

WEST COAST FACTORY REPRESENTATIVES—RUSSELL AND COMPANY, 1355 Market Street, San Francisco 3, Calif.; HARRY F. HALDEMAN, INC., 1106 South Hope Street, Los Angeles 15, Calif.; FRED W. CARLSON, 307 Wall Street, Seattle 1, Wash.; JOHN W. LADLOW, P.O. Box 1784, Phoenix, Ariz.

Electric Iron (1004)

The Universal Champion electric iron features a fully automatic fabric dial, relocated for maximum operating efficiency; plastic handle; over-size sole plate; rounded heel designed for protection of fabric against back stroke wrinkles; one-piece solid heel rest. The iron operates on a-c, is rated at 1.000 watts.

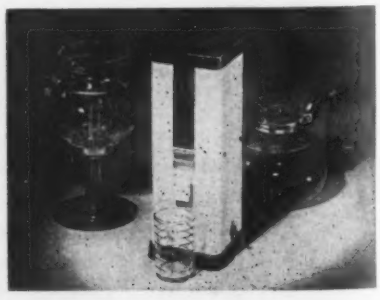


Toast Timer (1005)

By means of a Toast-Timer feature incorporated in the new Universal automatic toaster, bread may be inspected without interrupting the toasting cycle. This control is a separate lever and may be operated independently of the toasting process control. The unit is chromium-finished, with base and handles of bakelite; has a selection dial and a hinged tray for easy cleaning.

Coffee Grinder (1006)

Cory has developed an electric coffee grinder, designed to operate on a-c or d-c and measuring 4 in. wide and deep and 11 in. high. A measuring glass graduated from one to eight cups is furnished. The grinder holds one pound of whole bean coffee and can be adjusted for any type grind.



Travel Iron (1007)

Travel-Made Corp. is making a travel iron for use on a-c or d-c, 375 watts, 115 volts. Its plastic handle was designed for easy gripping, is said to be positive locking and easily assembled. The iron has chrome finish, nichrome heating element.

Light

for better sight everywhere

GRAYBAR OFFERS SPECIALIZED HELP ON LIGHTING PLANS . . . HAS WIDEST SELECTION OF EQUIPMENT

• Graybar Lighting Specialists are constantly assisting utilities; electrical contractors; builders; and operators of industrial, commercial, and institutional establishments — to raise the standards of lighting everywhere for greater safety, more efficient work, more comfortable seeing.

Graybar has the knowledge and the equipment to help you provide efficient, modern lighting for streets, highways, yards, play areas, plants, stores, offices, farms, or homes. *Whatever the lighting requirements, Graybar can impartially recommend the most suitable equipment from the most complete selection of lamps and lighting units available from any one source.*

Graybar Lighting Specialists are always ready to assist you or your customers in any lighting project. Just call the Graybar office nearest you. 4687

GRAYBAR ELECTRIC COMPANY
Boise, Denver, Los Angeles, Oakland, Phoenix, Portland, Sacramento, Salt Lake City, San Diego, San Francisco, Seattle, Spokane, Tacoma

Via GraybaR
Everything Electrical

IN OVER 90 PRINCIPAL CITIES

New FCC RULING

"Frequencies available—
(a) The following frequencies are allocated for use by power utility stations:

•

12 channels in 25-30 Mc band

•

7 channels in 30-40 Mc band

•

6 channels in 72-76 Mc band

•

6 channels in 152-162 Mc band"

TAKE advantage of the new FCC ruling. Utilize 2-way FM radio with its important advantages.

Here is the communications system that opens new opportunities in maintenance coordination. It assures you instantaneous and solid contact day and night with your service crews—at every point throughout your service area. It will give you unmatched reliability for efficient handling of routine and all emergency operations.

General Electric—pioneer in 2-way FM radio for utilities, police, and fire fighting—has a complete new line of proved FM radio equipment to meet all communication needs.

G-E radio engineers, located in all principal cities, are ready to assist you with your communications problems. Meet them. They are good men to know.

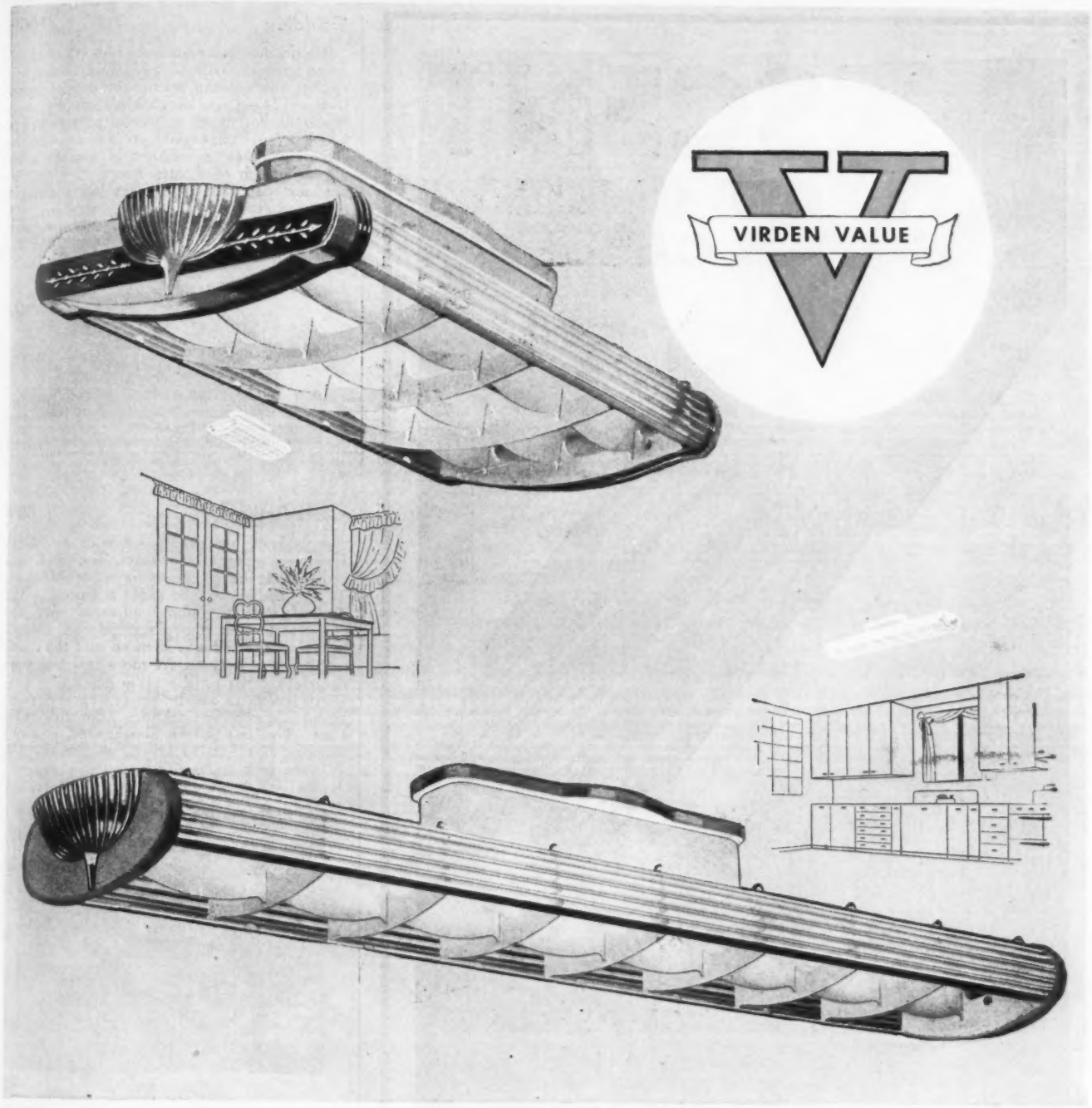
These specialists will help you plan your installation and select the correct equipment for optimum performance. In addition, they will aid you in preparing your FCC construction permit application, and help to train your personnel for FCC examination and radio technique.

For immediate help and complete information, call or write your local G-E office or the *Electronics Department, General Electric Company, Section 501A, Syracuse 1, New York.*

Everything for 2-way Radio

GENERAL ELECTRIC

163-E8-6918



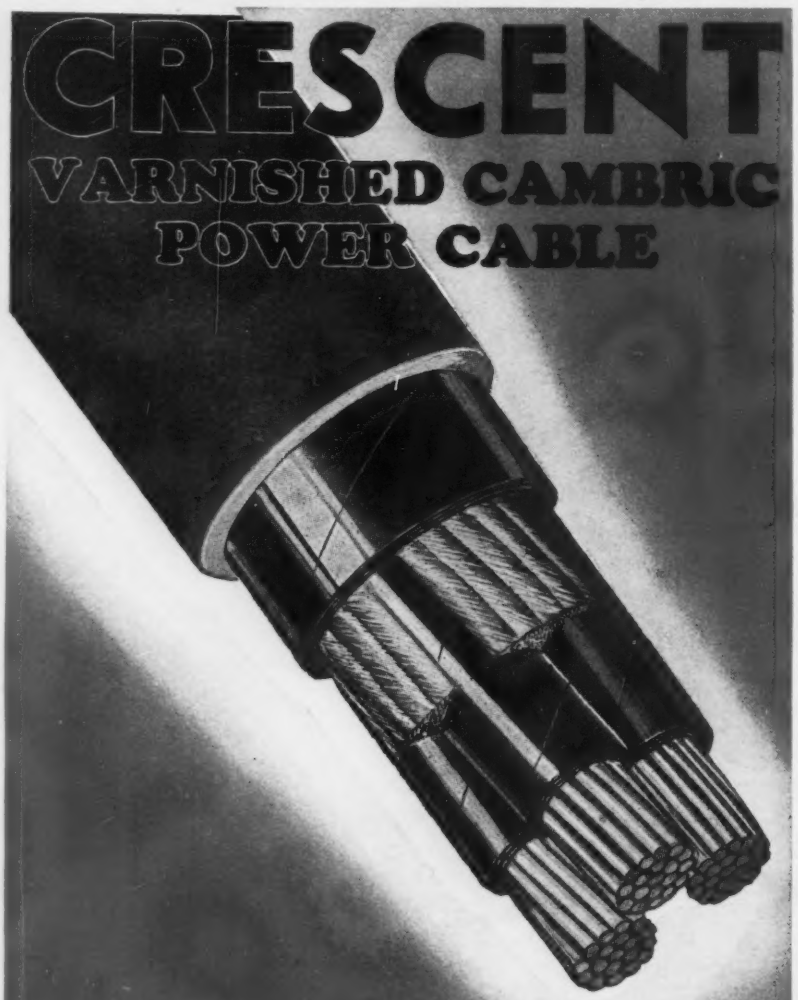
New RESIDENTIAL Fluorescents...ready soon

• At the top a new 4, 20-watt lamp fixture that will be widely used in residential lighting for both kitchen and dining room lighting. A ceiling fixture of the first rank. Utilizes plastics for both decorative and lighting effect. No need to tell you it's rich in beauty and will go over big. It's right in price, performance and personality. • Below is our 2, 40-watt lamp unit for the kitchen. Your customers will like it.

Virden jobbers are always glad to co-operate.

John C. Virden Company • Cleveland, Ohio

Member American Home Lighting Institute



Heavier loads for longer periods of time than formerly possible are obtainable with CRESCENT VARNISHED CAMBRIC CABLE. This general-purpose, industrial power cable provides higher current carrying capacity for the same size of copper conductors, together with maximum safety and permanence.

CRESCENT
WIRE & CABLE

CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

Griddle (1008)

Thermador has resumed production of its speed griddle. This portable unit is for use at the table, in the kitchen or out-of doors. It has 171 sq. in. of cooking surface, will fry eight hot cakes at the same time; has a porcelain enameled grease drawer to catch drippings, a polished aluminum griddle top which eliminates necessity of greasing for pancakes and eggs. New toggle type switches provide three speeds, 500, 1,000 and 1,500 watts at 120 volts a-c. The unit is 5 7/8 in. high, 15 in. deep, 22½ in. long, weighs 23½ lb.

Clock-Radio (1009)

A bedside clock-radio set with an alarm feature is a new G-E product. The clock and radio work independently or in conjunction. To use the alarm, the radio is tuned to the desired station, volume adjusted and the clock set; when the alarm selector control is turned the radio is silenced and the clock continues to operate. At the appointed hour the clock turns on the radio again. An auxiliary resonator can be set to sound a regulation alarm a few minutes after the radio starts. The unit is in a plastic case, is about the size of a loaf of bread, weighs about 5 lb., has four tubes.

Freezer (1010)

Eskimo Freeze, a home freezer unit being produced by Reynolds Metals Co., features an aluminum inner liner, said to speed up the rate of cooling. Built with a lift top, this freezer is 36. in high, 40 in. long and 28 in. deep, has 6 cu. ft. capacity, weighs 185 lb.

Room Heater (1011)

A circular stand type electrical room heater has been announced by the Tepfer Appliance Co. It stands 30 in. high, requires six inches of floor space. A series of aluminum louvres throws the heat outward in a rapid circulating movement.

Occasional Clock (1012)

The G-E Pristine tambour occasional clock has a mahogany case, a satin-white dial with black numerals, storm-blue hands. It measures 5⅛ in. high, 12⅝ in. wide, 3⅛ in. deep, will sell for $9.80 plus tax.

Explosion-Proof CONDULETS

The illustrations show a representative selection from the thousands of types and sizes of Explosion Proof Condulets, especially designed for use in electrical installations in locations that are hazardous because flammable atmospheres are present or likely to be present.

(CONDULETS are made only by CROUSE-HINDS)

No. 12
of a series of advertisements which demonstrate that CROUSE HINDS "complete line" means much more than just a range of sizes – there is a wide variety of highly specialized types in each classification.

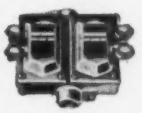
Type CUB Explosion-Proof Instrument Conduiet

Type HRC Explosion-Proof Mercury Switch Thermostat Conduiet

Type CUP Explosion-Proof Conduiet

Type EFS Explosion-Proof Switch Conduiet

Type GUAP Explosion-Proof Conduiet


Type EFSC Two-Gang Explosion-Proof Push Button Switch Conduiet

Type CPS "T" Explosion-Proof Conduiet

Adjustable Type EHS Explosion-Proof Delayed Action Receptacle Conduiet with Chromium Face Plate for hospital operating rooms and similar hazardous locations

Type FSQ Explosion-Proof Interlocking Receptacle and Switch Conduiet with Plug

Type EVH Explosion-Proof Hand Lamp

Type RCDE-8 Explosion-Proof Floodlight 200-Watt

Type GUJL Explosion-Proof Conduiet

Type OFC Explosion-Proo. Push Button Station Conduiet

Type EHS Explosion-Proof Triple Switch Conduiet

Type GUEL Explosion-Proof Conduiet

Type EGP Explosion-Proof Push Button Station and Pilot Light Conduiet for panel mounting

Type CES Explosion-Proof Delayed Action Arktite Plug Receptacle Conduiet

Type EVA Explosion-Proof Lighting Fixture 150-Watt

Type ELG Explosion-Proof Gauge Lighting Conduiet Fluorescent

Type EMH Explosion-Proof Instrument Conduiet

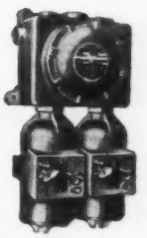
Type GUAC Explosion-Proof Conduiet

Type EJH Explosion-Proof Conduiet with Dome Cover

Type EHS Explosion-Proof Signal Light Conduiet

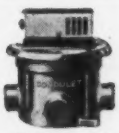
Type CPS Explosion-Proof Delayed Action Arktite Receptacle with Plug

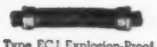
Type EVA Explosion-Proof Sign Light Conduiet


Type ESP Explosion-Proof Panelboard

Type EZS Explosion-Proof Sealing Conduiet for 3-1/2 to 6-inch conduit

Type ESC Explosion-Proof Conduiet


Type FLB Explosion-Proof Circuit Breaker Conduiet


Type ECJ Explosion-Proof Flexible Coupling

Type LBH Explosion-Proof Conduiet

Type HR Explosion-Proof Thermostat Conduiet

Type EHS Explosion-Proof Thermostat Conduiet

Type CPS Two-Gang Explosion-Proof Delayed Action Arktite Receptacle

Type ELG Explosion-Proof Gauge Lighting Conduiet

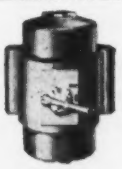
Type GUSC Two-Gang Explosion-Proof Circuit Breaker Conduiet

Type ECD Breather Valve

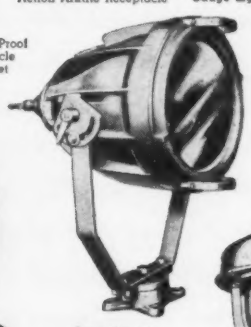
Type ECD Drain Valve

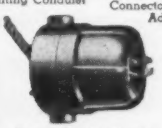
Type UNA Explosion-Proof Connector with Angular Adjustment

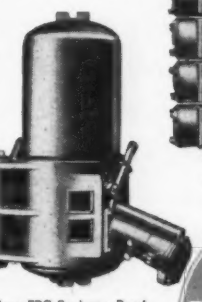
Type EPH Pothead Explosion-Proof Conduiet

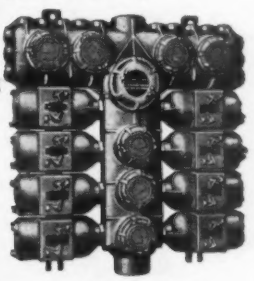

EPC Series Explosion-Proof Conduiets Motor Starters, Circuit Breakers and Combinations

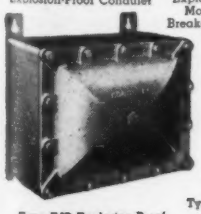
Type FSQC Explosion-Proof Interlocking Receptacle and Switch Conduiet


Type RLEE-14 Explosion-Proof Floodlight 500-Watt

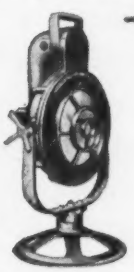

Type EMS Explosion-Proof Mercury Limit Switch Conduiet

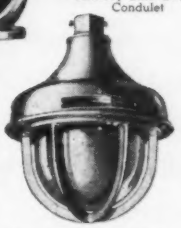

Type EPC Explosion-Proof Interlocking Plug Receptacle and Cucuit Breaker Conduiet


Type EDP Explosion-Proof Pageboard


Type EJB Explosion-Proof Conduiet

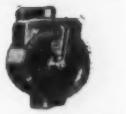
Type EVG Explosion-Proof Lighting Conduiet for gasoline pumps


Type RCDE-8 Explosion-Proof Portable Floodlight 200-Watt

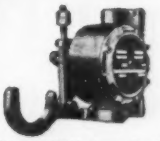

Type EVA Explosion-Proof Lighting Fixture 500-Watt

Type ETR Explosion-Proof Bell Signal

Type ETH Explosion-Proof Howler Signal Conduiet


Type FLDC Explosion-Proof Secondary Breaker Conduiet

Type ETH Explosion-Proof Siren Signal


Type FGCH Explosion-Proof Switch Conduiet for gasoline bulk stations

Type EZS Explosion-Proof Sealing Conduiet for 1/2 to 3-inch conduit

Type EYS Explosion-Proof Sealing Conduiet

A Nationwide Distribution Through Electrical Wholesalers

Complete listings of each type are in Conduiet Catalog 2500.

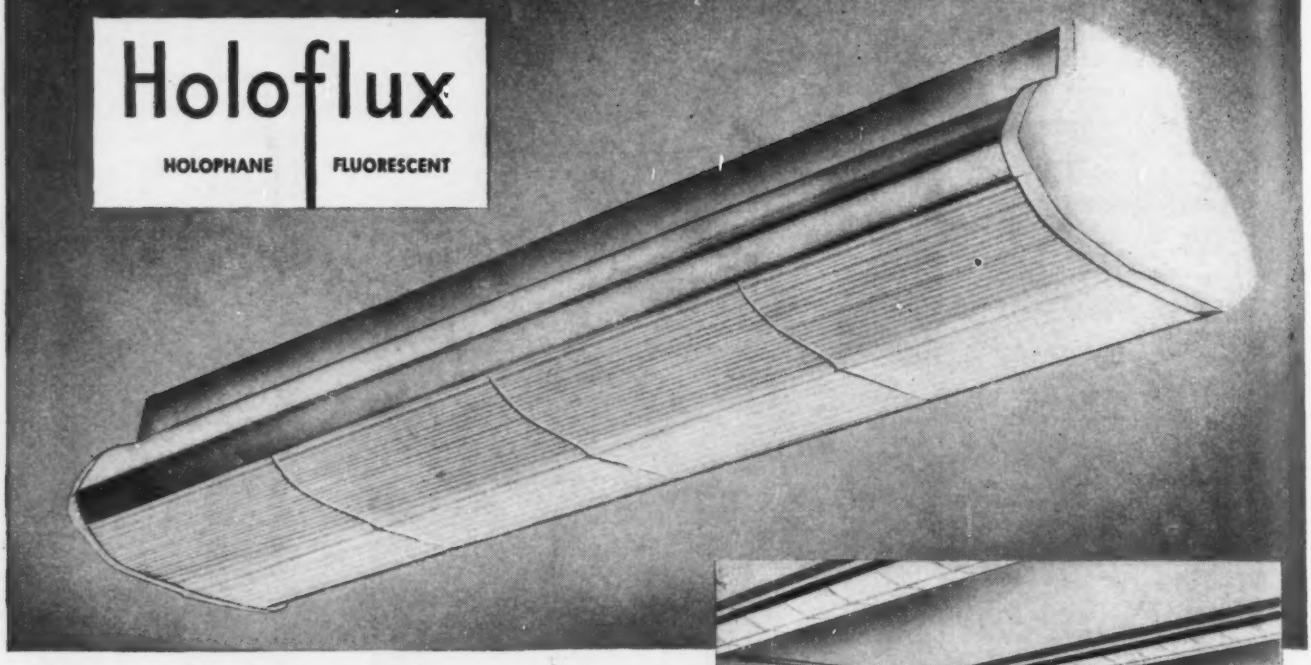
CROUSE-HINDS COMPANY
Syracuse 1, N. Y., U.S.A.

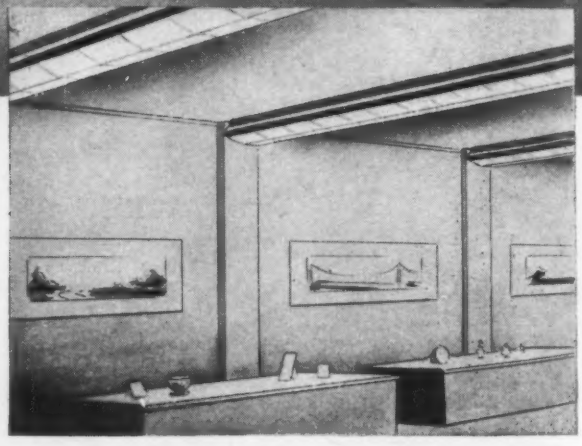
Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Kansas City — Los Angeles — Milwaukee — Minneapolis — New York — Philadelphia — Pittsburgh — Portland, Ore. — San Francisco — Seattle — St Louis — Washington. *Resident Sales Engineers:* Albany — Atlanta — Charlotte — Indianapolis — New Orleans / CROUSE-HINDS COMPANY OF CANADA LTD. *Main Office and Plant:* TORONTO, ONT.

CONDULETS • TRAFFIC SIGNALS • AIRPORT LIGHTING • FLOODLIGHTS

NEW! Holoflux Close-Ceiling Unit...Engineered to Provide Efficient, Economical, Fluorescent Lighting...

Holoflux
HOLOPHANE | FLUORESCENT





✓ **Fully Enclosed**
for economical maintenance

✓ **Smartly Designed**
for modern commercial interiors

Holophane Engineering Research contributes another important advance in *planned* fluorescent lighting for commercial interiors. This new close-ceiling unit embodies the characteristic advantages of all Holoflux products—the control of down-light by the use of Controlens, increasing illumination in the vital 0-60° zone, reducing glare to a minimum . . . An upper refracting section spreads ceiling light, which reduces contrast between the unit and its background . . . Equally important, the enclosed construction protects it from the collection of dust and dirt, affording marked savings in maintenance costs . . . And this unit is as good-looking as it is practical—its smart, smooth lines should fit gracefully in most interiors.

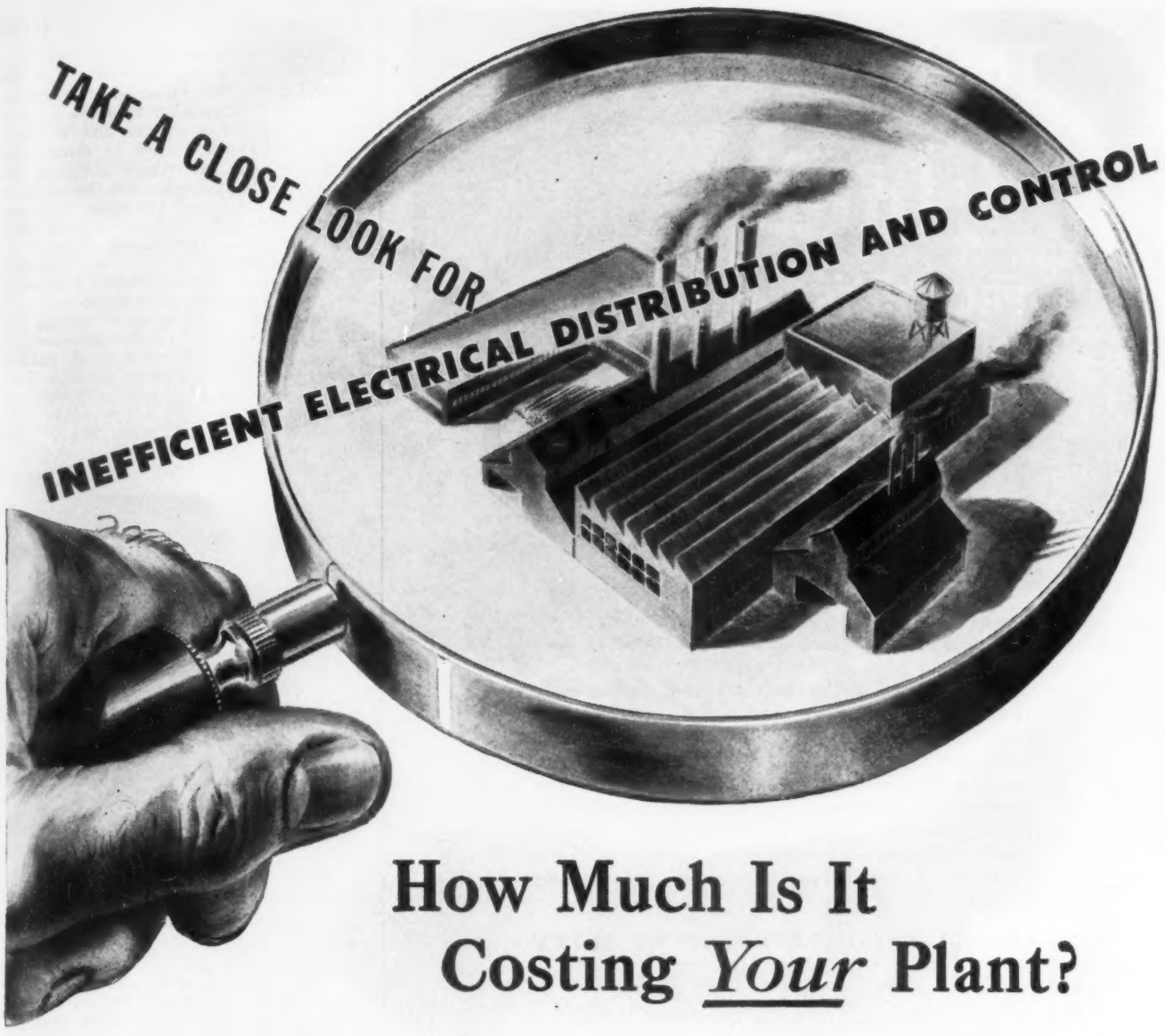
Illustration shows how Holoflux Close-ceiling Units may be joined to provide continuous lines of light. Units may be dropped on stems to avoid beams, sprinklers, etc. Units take 2, 3, or 4 lamps per section.

Write for Data . . . Consult Holophane Engineers, no Obligation.

HOLOPHANE COMPANY, INC. . . . *Lighting Authorities Since 1898*

342 Madison Avenue, New York 17 • Holophane Co., Ltd., 385 Yonge St., Toronto, Can.

Pacific Coast Representatives:—R. G. Dummel, San Francisco; F. van Gilluwe, Los Angeles
Distributors, General Electric Supply Corp.



How Much Is It Costing *Your* Plant?

● You're looking for ways and means to cut costs. A logical place to start checking is your plant's electrical distribution and control system. For here is a key factor in production cost.

During recent years, thousands of electrical systems have been operating under abnormal stress. They have become overloaded and unreliable...poorly located or improperly applied in relation to present needs. Under such conditions, serious production losses are a certainty.

Check with your head electrical man. If he sees potential profit leaks, a Square D Field Engineer will (without obligation) work with him in plugging them.

The counsel of experienced Square D Field Engineers is available through Square D offices located in 50 principal U. S. and Canadian cities.

Wherever electricity is distributed and controlled

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

The New Home of Lloyd PRODUCTS

Lloyd appreciates the patience and forbearance you have shown when overloaded manufacturing facilities slowed down delivery of Lloyd Flex-Loc Lamp Holders and Lloyd Automatic Starters. We are now at home in this large modern plant, where greatly increased facilities will make possible greater service to all our customers . . . service which we hope will match in quality the matchless Flex-Loc Lamp Holders and Lloyd Automatic Starters.

LLOYD POLICY INSURES QUALITY

651-F
FLEX-LOC Lamp Holder

Automatically self-adjusting. Engineered to fit ALL STANDARD spacings. POSITIVE AUTOMATIC LOCK. PERFECT ELECTRICAL CONTACT. Brass contacts grip BOTH sides of lamp pins securely.

Listed and Approved by Underwriters' Lab., Inc., and Canadian Standards Assoc., App. Division E.T.L. Test Report 314454 Available

Patented—Other patents pending.

FS-40
AUTOMATIC Starter

CUTS OUT deactivated or flickering lamps. CUTS OUT current to lamp and ballast. Increases life of lamp and ballast.

Listed and Approved by Underwriters' Lab., Inc.

Certified by E.T.L., Spec. 6 Pat. Nos. 2200443-2228210

LLOYD PRODUCTS CO.

PROVIDENCE 5 RHODE ISLAND

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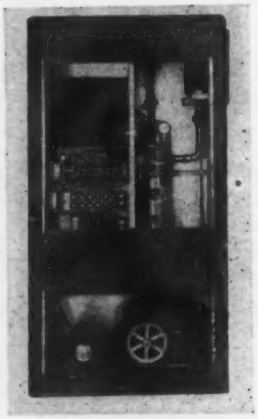
FRANK H. BRAN CO.
894 Folsom St., San Francisco

HARVEY M. OLMSTEAD
1534 Warren St., Denver

WILLIAM H. SANDERLIN, 129 First Ave., Seattle

Heating Unit (1013)

An electric vapor heat unit, called the Vap-O-Lec, is being manufactured by the Cronholm Mfg. Co. Fresh air is drawn into the unit and through air filters by a sound-proofed circulating system and is finally channeled through a bank of sharp multi-spined copper fins which discharge the steam-vapor heat directly into the air ducts. A hermetically sealed generator, which employs a percolating action, contains emersion type low-voltage heating elements encased in copper tubes with a small quantity of water sealed in under reduced pressure. It is claimed that heat is produced within 30 sec. after the system is turned on and that the unit is operating at full efficiency within 3 min. Pressurestat control of mercury switches automatically limits the flow of energy in the coils. The unit is available in colors and is said to be a few inches wider and taller than a refrigerator. 230-volt service is required.



Room Conditioners (1014)

York Corp. has announced three new room conditioners, two of them window sill models and all of them designed for homes and small offices. These models are in a walnut wood cabinet, can be moved from room to room. Removable filter pads are provided. According to the manufacturer, the conditioner can remove 60 cu. ft. of stale air per minute while cooling and, without cooling, can change 240 cu. ft. per minute. Moisture condensed from the room air is evaporated into the rejected air stream and no plumbing installation is required, it is stated.

Ventilating Fan (1015)

Ilg has a ventilating fan with a 3⅜-in. sleeve, designed for permanent mounting in homes with thin-wall construction or for installation in a steel sash or other small panel window. This 8-in. fan has a capacity of 350 c.f.m.; is said to provide a two-minute air change in kitchens up to 700 cu. ft.

Water Heaters (1016)

For homes, service stations, offices and shops, small-capacity automatic electric water heaters are being offered by Modohome Products Inc. in three sizes, 3, 5 and 7½ gal. All units operate on 110-115 volts a-c.

Infrared Heat Lamp (1017)

An infrared heat lamp with Pyrex bulb has been added to the Penetray line. The bulb is red-colored to cut down glare. Retail price is $3.50, according to the announcement.

I don't worry

—about a job I do with Central Conduit because long after it's finished I know that Central quality will be in there working for me year after year.

"There's Tested Strength in Every Length"

CENTRAL
RIGID STEEL
CONDUIT

SPANG-CHALFANT

Division of The National Supply Company

General Sales Office: Grant Building, Pittsburgh 30, Pa.

District Offices and Sales Representatives in Principal Cities

INFORMATION PLEASE

"—Who sells this product in the West?"

"Where can I buy—?"

This is the recurring theme in letter and phone call to the offices of ELECTRICAL WEST. We're glad to be a clearing house for this sort of information because it proves we're playing a part in the continuing growth of the West.

It proves to us also, the soundness of the service performed by the yearly Manufacturers' Directory Issue published each April for the last 14 years.

We hope that you have kept your April Directory Issue handy, and that you use it when you need information about manufacturers of electrical equipment and their sales and service representatives in the western states.

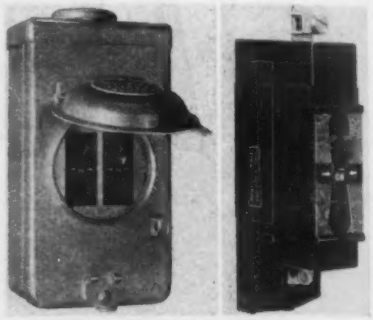
Remember, when you want to know where to buy electrical equipment in the West, look it up in the Manufacturers' Directory issue of ELECTRICAL WEST. Published annually as part of the April issue.

ELECTRICAL WEST

Spokesman for the most highly electrified section of the U. S.

Circuit Breakers (1018)

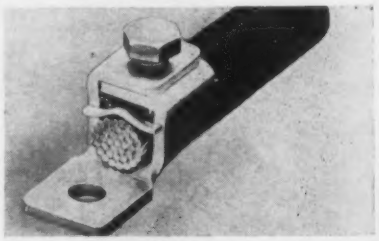
A new line of Murray magnetic circuit breakers is available separately or in outdoor weatherproof service equipment and load centers. According to Metropolitan Device Corp., manufacturer of the line, the breaker is a positive-acting device, operating by magnetism, and it can be reset immediately if electrical conditions permit. Switch handles are prominently marked on and off; there is no trip position. Breakers are supplied single pole, 10 to 50 amp. Load centers are made to take up to six circuit breakers.



Plugging Switches (1019)

A new line of oiltight and dustproof plugging switches for flange and surface mounting has been announced by G-E. The new switches are designed to remove plugging power from a motor at the correct moment, to keep the motor from restarting in the reverse direction. The flange-mounted form is used for built-in applications, the surface-mounted type for general purpose use. Contacts are silver and can handle directly the coil current of a 150-amp. contactor. A lockout device can be provided to release the lockout latch and permit normal operation of the switch when the motor is connected to the line. Maximum continuous rotating speed is 1,800 r.p.m. Two sizes of springs provide for adjustment of contact operating speed over ranges of 40 to 140 r.p.m. and 140 to 750 r.p.m.

Cable Connector (1020)



A large-size Scrulug has been added to the Burndy line. The new size, KPA34, accomodates a range from No. 4/0 wire to 500 Mcm. cable. It was designed to have the operating characteristics of the largest cable.

Overhead Connectors (1021)

Burndy is making a line of Hysplice overhead connectors using Penetrox, a compound claimed to penetrate oxide on conductor surfaces and to seal them against air and moisture. Available in types for jumper loops and full tension service, connectors are supplied filled with the compound and sealed at each end. The cellulose seals are removed on the job. Hysplice and Hytaps for aluminum cables are filled with Penetrox-A, those for copper cables with Penetrox-C.

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Winning the APPLAUSE OF THE INDUSTRY

Pedigree Varnishes

Check your requirements against the materials listed in this big useful book.

Dependable performance through the years has won Pedigree Varnishes top billing in the estimation of electrical engineering experts from coast to coast. Depend on this great name for uniform quality . . . laboratory-tested . . . proven in service.

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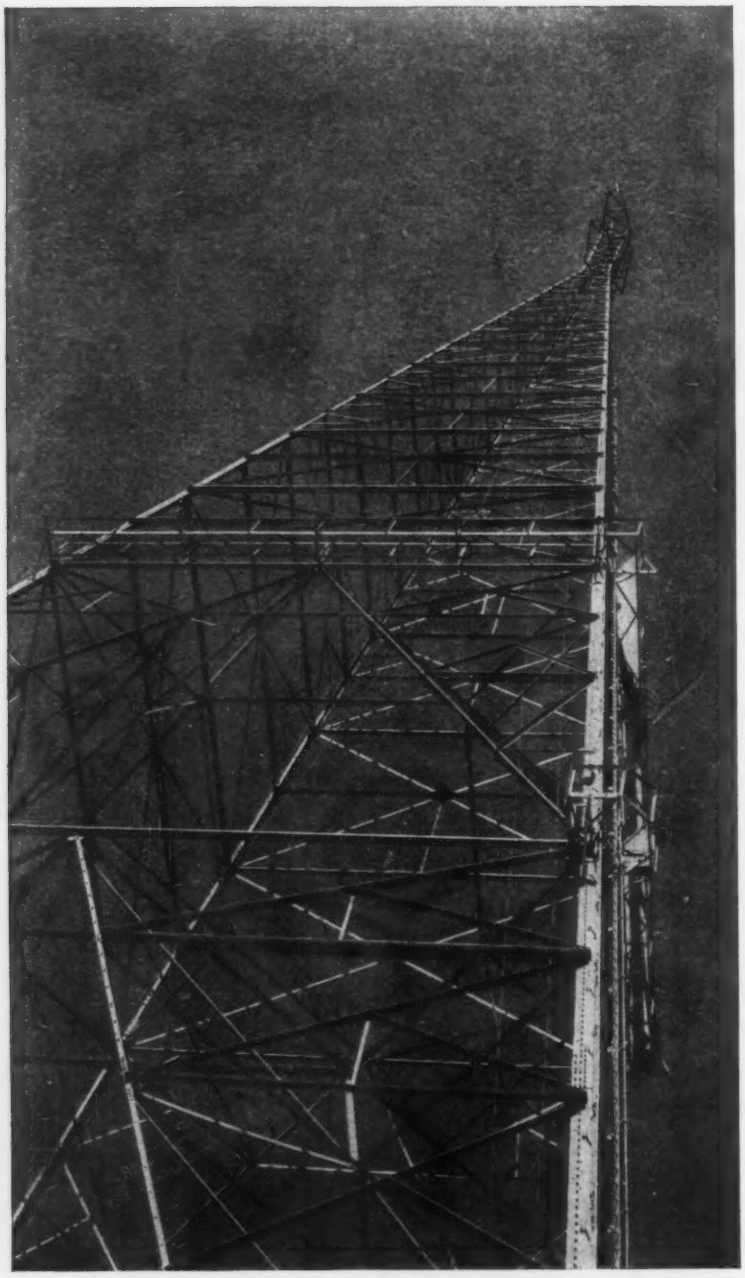
THE P. D. GEORGE COMPANY, ST. LOUIS, U. S. A.

ROLLED . . . FABRICATED . . . *on the Coast*



500 ft. tower now carrying Bonneville power across the Columbia River. Tower fabricated by Bethlehem Pacific.

Fabricating towers for power transmission is a Bethlehem Pacific specialty. Make a note of this company's integrated facilities for handling this type of steelwork:

- **Steel Mills and Manufacturing Plants . . . South San Francisco, Los Angeles, Seattle**
- **Steel Fabricating Works . . . South San Francisco, Alameda, Los Angeles**
- **Tower Fabricating and Galvanizing Shops . . . South San Francisco, Los Angeles**

With these complete and well-situated plants Bethlehem Pacific can readily produce and fabricate towers on any scale to meet the requirements of Western power producers.

But towers are only a part of the picture. Bethlehem Pacific also rolls and fabricates steel for bridges, buildings, hangars, refineries and various industrial structures.

Bethlehem Pacific Coast Steel Corporation

General Offices: San Francisco

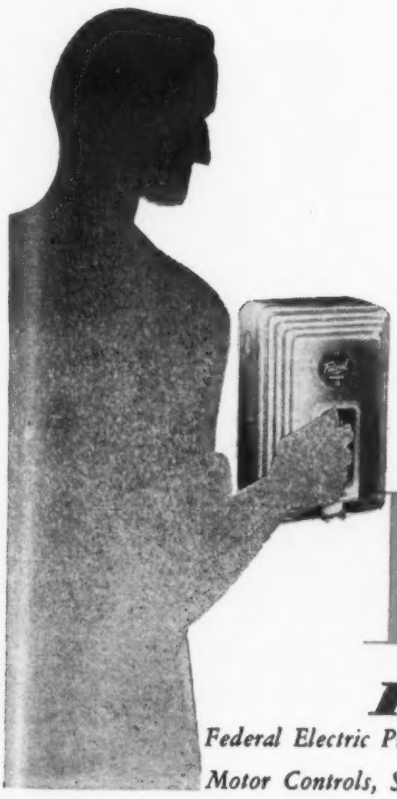
District Offices: Los Angeles, Portland, Seattle, Salt Lake City, Honolulu

★ BETHLEHEM STEEL ★

BETHLEHEM PACIFIC

Portrait of a MAINTENANCE MAN

A little exaggerated, perhaps . . . but what we're trying to say is simply this: FEDERAL NOARK Products are built to provide dependable performance wherever they're installed. Their many exclusive features of design and construction mean a minimum of supervision . . . and a real saving in maintenance costs. It's good sense—and good business to specify FEDERAL NOARK Electric Products! . . . Federal Electric Products Company, Executive Offices: 50 Paris Street, Newark 5, N. J. Plants: Hartford, Conn., Newark, N. J., St. Louis, Mo., L. I. City, N. Y.



Portrait of FEDERAL NOARK Magnetic Starter, Bulletin 404 in action

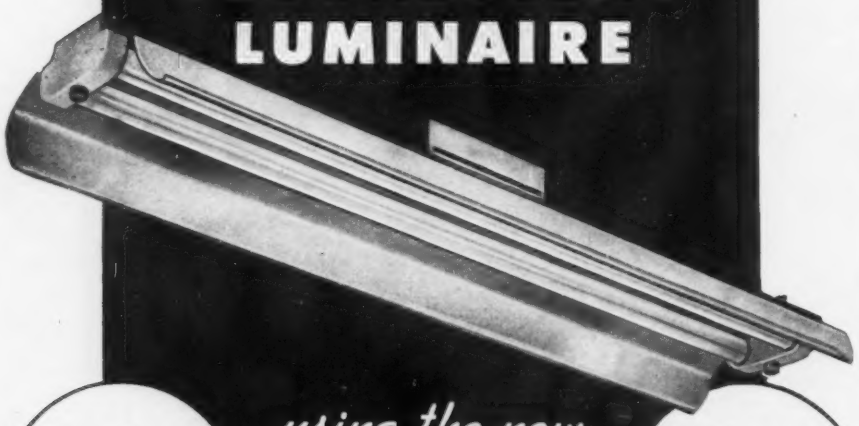
Federal NOARK

INDUSTRIAL CONTROLS

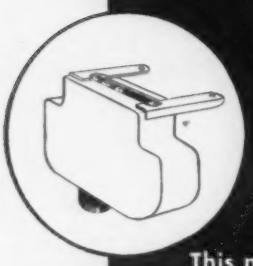
Federal Electric Products Company, manufacturers of a complete line of electrical products including: Motor Controls, Safety Switches, Circuit Breakers, Service Equipment, Panelboards and Switchboards

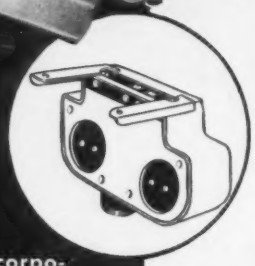
New!

TURRET-TYPE FLUORESCENT LUMINAIRE



using the new Twin Turret Lampholder





This new SMOOT-HOLMAN fixture incorporates the new *turret lampholder* which holds the lamps firmly in place without additional safeguards. The lamps are quickly inserted by depressing either face of the turret with one end of the lamp until the other end clears the opposite face and slips into place. The turret lampholder permits use of the new Jack Rabbit, for split-second starting. The luminaire itself is crafted according to Smoot-Holman quality and conforms to the new 9A RLM specification. Overall length 49⅛", width 11⅞", height 7".

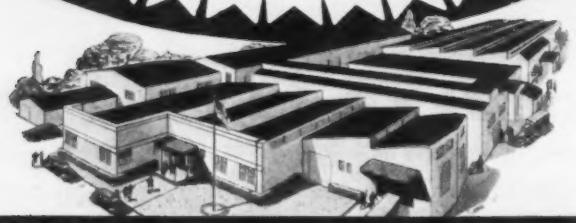
Catalog No. NET – 2461

SMOOT-HOLMAN COMPANY

SMOOT-HOLMAN

INGLEWOOD, CALIFORNIA

MADE IN U.S.A.



Offices in Principal Western Cities—Branch and Warehouse in San Francisco

Multibreaker (1022)

Square D has developed a 4-pole multibreaker with both thermal and high-speed magnetic tripping action and available for flush or surface mounting. It was designed to meet the demand for multibreakers for low-cost housing and as load centers in farm electrification, and offers an assortment of branch circuit capacities of 15, 20 and 30 amp. Two single poles can be converted easily to a double pole for a two- or three-wire circuit, the manufacturer states. A movement of the handle will restore current to the circuit after the cause of the interruption has been corrected, but current cannot be restored as long as trouble exists in the circuit. The MO-4 contains no magnetic coils and no live parts are exposed in normal operation of the breaker or when restoring interrupted current. It is approved by Underwriters' and meets requirements of the 1946 National Electrical Code, it is stated.

Crystal Converters (1023)

Compact silicon crystal converters for use as first detectors in high-frequency superheterodyne receivers have been announced by Sylvania Electric Products Inc. The crystals are permanently present in a small cartridge measuring approximately ¾ in. long and ¼ in. in diameter and are available in three types for frequencies up to 10,000 mc. Crystal converters require no filament or heater supply. Low thermal noise and i-f impedance are other features claimed for them.

Television Capacitors (1024)

Hermetically sealed high-voltage capacitors designed for use in rectified radio-frequency type power supplies for television receivers and other cathode-ray tube applications have been announced by Solar Mfg. Corp. Available in voltage ratings up to 30,000 kilovolts wvdc, and in capacitances up to 500 mmf, they are housed in solder-sealed glass bushings with either ferrule or screw terminals.

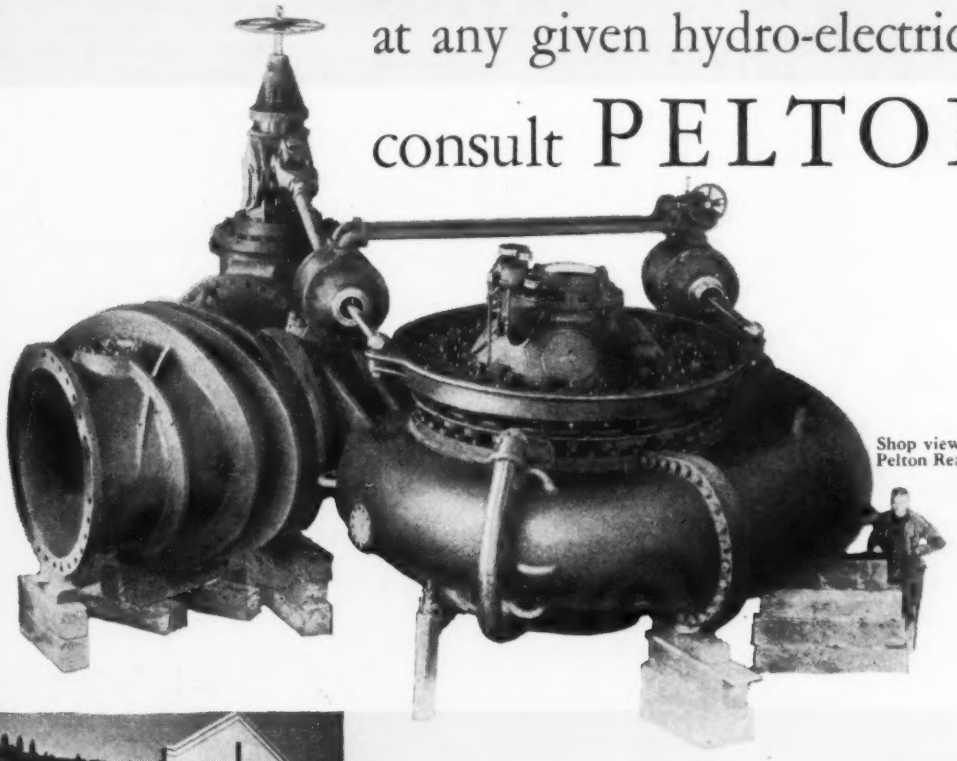
Exposure Meter (1025)

An exposure meter which incorporates the new American Standards Assn. (ASA) exposure-index numbers has been announced by G-E. The ASA film-rating system is being adopted by the nation's leading film manufacturers. The meter is like the DW-58 except for the dial on the front.

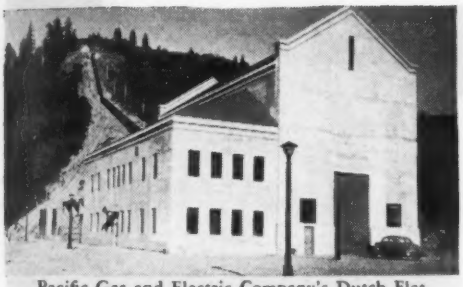
For MAXIMUM POWER DEVELOPMENT

at any given hydro-electric site . . .

consult PELTON

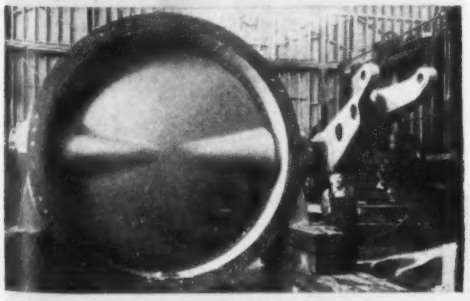


Shop view of 44,000 hp. Pelton Reaction Turbine.



Pacific Gas and Electric Company's Dutch Flat Power House in California where one 29,000 hp. Pelton Reaction Turbine is installed.

City of Tacoma's Alder Dam and Power House where two 34,500 hp. Pelton Reaction Turbines are used.



10-FOOT BUTTERFLY VALVE
Pelton has the hydraulic engineers, the long experience and the gigantic machine tools for building huge valves for penstocks carrying water to Pelton Turbines which are made in sizes up to 70,000 horsepower and more.

PELTON is COMPLETING TURBINES for use in North America, Colombia, Peru and Africa

To develop the maximum horsepower at any given hydro-electric site, Pelton engineers design the turbine for the particular water conditions.

That is why Pelton is building turbines for installation over the world.

Throughout 66 years of turbine construction, Pelton has made laboratory experiments as to the shape and contour of impulse buckets, the curvature of reaction-turbine runners, sizes, abrasives in the water and so on.

Then the Pelton organization of skilled men using modern machine tools builds the turbines and skilled engineers supervise installation and check performance.

Such accumulation of science and manufacturing experience assures purchasers that each turbine will develop the required horsepower at any given hydro-electric site. Moreover, Pelton Turbines are built *right*—to withstand long years of continuous operation free from trouble.

BLW THE BALDWIN GROUP

The PELTON WATER WHEEL Company

Subsidiary of The Baldwin Locomotive Works

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There is but one true measure of the value of a water heater and that is, performance—plenty of hot water, long trouble-free service.

Two exclusive Clark features—Ionodic Tank Protection and Life-Belt Heating Element, enable the Clark Electric Water Heater to give performance unequalled by any other heater on the market.

Judged by performance or any other standard, the Clark today, even more than ever, is the greatest water heater value on the market.

McGRAW ELECTRIC COMPANY

CLARK WATER HEATER DIV.

5201 W. 65th St.
CHICAGO 38, ILL.

CLARK
ELECTRIC WATER HEATERS
A Toastmaster Product

BULLETINS

data books, etc.

Interior Lighting (1026)

Information for designing interior lighting installations is contained in a new eight-page folder announced by Westinghouse. Essential data is contained in tables covering popular types of luminaires, lamps and ballasts.

Special emphasis is placed on maintenance with a range of values being given for each luminaire, thus enabling the designer to make an estimate of the depreciation which may be expected under good, medium and poor maintenance conditions.

In addition to the generally used method of determining average illumination values, tables and curves are given which will permit the calculation of illumination at various points when produced by a direct lighting unit such as the reflector or projector lamp.

Potheads (1027)

Publication No. 4607 recently issued by the Delta-Star Electric Co., describes and lists a line of single-conductor cable terminators or potheads. They are of the sealed type for indoor and outdoor service and made in ratings up to 46 kv. and all standard ampere capacities.

Heating Units (1028)

A folder available from Electromode Corp. gives specifications for its Bilt-in-Wall house-heating units in 1,500-, 2,000-, and 3,000-watt capacities, and for the 1,320-watt unit. The latter, designed for small rooms, operates on the regular 110-volt, 60-cycle system.

Sound Equipment (1029)

Stromberg-Carlson sound equipment is described in a four-page folder available from the company.

Transformer Chart (1030)

To show how banked secondary transformers operate under overload or fault conditions, a new CSPB transformer demonstration chart is announced by Westinghouse Electric Corp. Transformer operation under various system conditions is indicated by means of a disc which turns to show operation of bimetals and signal lights as the load on the transformer increases, opening of contacts, and darkened houses when the fault or excessive overload is sectionalized. On its reverse side, the chart discusses the advantages CSPB transformers bring to conventional banked secondary systems.

Insulating Varnish (1031)

"How to use DC 996" is the title of a Dow Corning Corp. folder on this silicone insulating varnish.

Relay Catalog (1032)

Leach Relay Co. has a 48-page catalog for distribution to engineers and purchasing agents.

Control (1033)

Hysterset electronic control of reactance dimmers for a stage switchboard is covered in a recent Ward Leonard bulletin.

Plastic Reflectors (1034)

Plastic reflectors and shades for light conditioning are shown in a 12-page bulletin from General Electric. Available models and their uses are described.

Home Freezer (1035)

Features of the Chapman home freezer are listed in a small folder available from the company.

Soldering Unit (1036)

Marion Electrical Instrument Co. describes its portable bench type induction soldering unit in a four-page folder recently issued.

Aerial Cable (1037)

Simplex Wire & Cable Co. has issued data sheets No. 116 and No. 117 on aerial cable. No. 117 covers specifically Simplex self-supporting aerial type cable.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

1000	1001	1002	1003	1004	1005	1006	1007
1008	1009	1010	1011	1012	1013	1014	1015
1016	1017	1018	1019	1020	1021	1022	1023
1024	1025	1026	1027	1028	1029	1030	1031
1032	1033	1034	1035	1036	1037		

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* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

AIRPORT LIGHTING *must not fail!*

It's an Underground Job for ROEBLING Parkway Cable

IN THE BLACK OF NIGHT, pilots must depend on the airport's electrical guides to bring them in . . . safely. Now, with runways being lengthened, new airports planned, these guides will multiply. Providing unfailing transmission of power for such vital lighting purposes is another job for Roebling rubber insulated Parkway Cable.

It's Dependable—to assure the steady, uninterrupted service that's a "must" for safety.

It's Underground—safely buried to eliminate the hazards of pole interference and exposure to weather.

It's Low in Installation Cost—because no expensive duct systems are needed. Easily, quickly, it can be laid directly in a shallow trench or "plowed" in.

A complete range of types and sizes is available—in metallic or non-metallic coverings, single or multiple conductors. And a Roebling engineer is *always* available to help you make the selection that's *right* for *your* service conditions . . . to help you get dependability at low cost. Our nearest branch office will gladly supply details.

JOHN A. ROEBLING'S SONS COMPANY
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Roebling Metallic Parkway Cable, 2 conductor, with flat steel tape armor protecting the lead sheath against crushing or puncture.

ROEBLING

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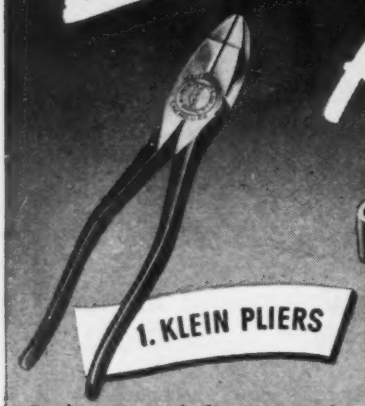
ELECTRICAL WIRES AND CABLES

Weatherproof Wire • Service Entrance Cables • Rubber and Plastic Covered Wires and Cables (Including Small Diameter Insulated Building Wires) Rubber Sheathed Portable Cables • Rubber Insulated Power Cables • Magnet Wire • Telephone Wires • Pigtail and Braided Copper • Bare Copper Strand Trolley Wire • Varnished Cambric Power Cables

FOUR GOOD REASONS WHY

Linemen are Kleinmen



1. KLEIN PLIERS

For linemen and electricians. The perfect balance, sharp knives, fitted hinge and perfectly matched jaws help do any wiring job better and faster.

2. KLEIN-KORD TOOL BELT

Designed and constructed to provide the safety, comfort and convenience needed for fast, efficient work. Uniformity and toughness of "Klein-Kord" permit use of positive-action, tongue-type buckle. All sizes.

3. KLEIN CLIMBERS

Made in standard and lightweight models. Forged from special steel—individually tempered. Spring-tempered shanks for leg comfort. Gaffs are correctly shaped to provide sure footing while the lineman works.

Wherever you see a lineman, it's a safe bet he's a Kleinman, too. His preference for Klein equipment is more than just a craftsman's pride in wanting the best. Behind this preference is the knowledge that with Kleins, he can do any job better, faster—and with maximum safety.

Because today's demand still exceeds supply, it may be some little time before your requirements can be completely filled. But your supplier will furnish the Klein equipment you need as rapidly as possible.

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York

4. KLEIN-KORD SAFETY STRAP

Standard for the industry since their introduction, they provide maximum safety on every job. The Red Center unmistakably signals when the strap should be replaced.

The Klein Pocket Tool Guide showing the Klein line and containing useful tool information will be sent on request.

Since 1857

Mathias KLEIN & Sons

Established 1857 — Chicago, Ill., U.S.A.

3200 BELMONT AVENUE, CHICAGO 18, ILLINOIS

BOOKS

you may want

INDUSTRIAL ELECTRIC LAMPS AND LIGHTING, by Edwin S. Lincoln, published by Essential Books, New York, in its Modern Electrical Series.

An up-to-date-treatment of illumination practice especially slanted toward the industrial plant. Contains complete description of every type of lamp suitable for industrial use. Valuable suggestions on the types of luminaires particularly adapted to industrial service are included, as well as detailed instructions and illumination design data for the computation of lighting intensities.

Especially noteworthy are the many illustrations and descriptions of methods of solving special lighting problems for quality inspection, machine tool operation, spray booth illumination, precision assembly and explosion-proof applications. Floodlighting and outdoor plant protective lighting are discussed in detail. Devices and methods for airport boundary and air obstruction lighting are included. Finally, industrial uses of bactericide and "black light" devices are fully covered.

INDUSTRIAL ELECTRIC WIRING, by E. S. Lincoln, 336 pp., 5½x8¼, index, illustrated. Essential Books, Duell, Sloan and Pearce, N. Y., $3.

The maintenance engineer, plant engineer, industrial contractor and estimator and designing electrical engineer will find this compact book on industrial wiring systems of considerable value, since it has most of the desired information in one volume. It treats of electrical fundamentals and systems and then goes into various industrial wiring systems, wiring methods, the Code. Other chapters are on polarity identification, protective grounding, wiring devices, outside wiring, overhead, and underground conduit systems. It has numerous diagrams which illustrate the text and also contains all the pertinent tables and National Electrical Code provisions dealing with each type of installation.

PRIMARY and STORAGE BATTERIES, by E. S. Lincoln, 168 pp., 5½x8¼, index, illustrated, Essential Books, Duell, Sloan and Pearce, N. Y., $3.

Another of the Modern Electrical Series, this book concentrates in one compact volume all the practical working information usually wanted in regard to batteries. It treats not only of the dry cells, but covers air cells, copper oxide caustic soda cells, storage batteries of the lead-acid type, nickel-iron alkaline storage batteries, the wiring for batteries, emergency lighting sets, generating equipment for charging, rectifiers and accessories. It also contains chapters on battery and rectifier maintenance.

PROTECTION OF ELECTRIC CIRCUITS AND MACHINES, by C. F. Hedlund and A. L. Brown, 70 p., published by Inspection Department, Factory Mutual Fire Insurance Cos., $2.

Reproduced by photolith and looks more like a magazine than a book. Takes up and illustrates in simple terms the how and why of safeguarding wiring and equipment, thereby serving to explain certain features of the National Electrical Code. Covers approved fuses, breakers, relays and thermal devices and their applications in protecting generators, transformers and motors.

FIXTURE-FINISHING FOREMEN can't play hunches!

Fuller Finishes help them keep fast production on the profit side

It's a tough, fast-stepping business—fixture finishing! Every contract different, exacting, in a hurry! Whether it's counters, bars, desks, display cases, tables, shelving, rails, wainscoting, stands, cabinets or special furnishings, Mr. Foreman's got to *know in advance* that he can come up with the decorative effect specified on any wood, metal, composition or plastic; move fast enough to avoid tying up his shop, and complete the job on the profit side.

Fixture Finishing is another specialty field where Fuller's laboratory cooperation pays; where Fuller's man-on-your-job contact helps keep fast production on schedule, and profitable.

It's as true in other fields Fuller serves. Every Fuller formulation is job-tested for correct application and use-proved for unquestioned service—in your plant, on your equipment, in or on your business building or in or on your home.

W. P. Fuller & Co. Factories, San Francisco, Los Angeles, Portland. Branches, warehouses in principal Western cities.

FULLER Industrial FINISHES

PRODUCTION FINISHES
Fuller Industrial Finishes do double duty: Meet production demands; give products durability and sales appeal.

MAINTENANCE FINISHES
Whatever the surface, there's a Fuller product exactingly formulated to protect it or beautify it.

AIRCRAFT FINISHES
War-improved, flight-famed Fuller Aircraft Finishes now available for private plane use. See your Airport Refinisher.

ELECTRA'S HUSBAND

Loyalty Can Help

WE were talking at the dinner table one evening recently about loyalty or rather the lack of it in many people who are earning their livelihood in the employ of corporations today.

"There is an old saying," our guest said, "that goes something like this: 'Whose bread I eat, his praise I sing.' A lot of people in all walks of business would do well to remember it and recall it continuously. Particularly is this so in the public service industry."

"Quiet down, Electra," I interrupted. "Bill wasn't praising your cooking."

"You shut up or you'll be eating all of your meals at your club," Electra said. "What I intended to do was sound a solemn 'amen' to Bill's statement. Every day I run into people who do more damage to the good will of the companies that employ them than can be corrected in a month of Sundays. If you show the slightest tendency to complain about service or stocks or anything else, they will chime in with all kinds of criticisms about their own organization and the dumb folks who work in other departments."

"Too many of these people fail to realize that when they unconsciously agree with customers who complain, they are not building good will or prestige either for their company or for themselves," Bill continued. "Take the utility business for instance. When a customer kicks about poor service, or a high bill or lack of attention, the complaint can be handled in one of two ways. The unthinking disloyal way is to agree and say that the company has hundreds of similar complaints every week, that the help is inefficient and that the people in the head office are a bunch of muttonheads who don't care whether the customer receives service or not.

"The other way is to listen to the customer patiently, get all of the details and then admit the fact if the complaint is justified. In most companies there is a definite procedure to be followed from there on out. But the war or the uncertainties of changing times or something seems to upset the reasonable normal reactions of employees; get them off the track."

"I've tried to reason it out," I commented. "Some of the blame can be placed on the fact that there are a lot of new employees in every organization. Another possible reason is that during the war regular training programs were interrupted. But no small part of it is traceable to the continuous radical attack upon business and management which has shaken the confidence of many workers and has affected their attitude and their loyalty. I don't know what the cure is."

"Isn't it in Bill's saying?" Electra asked. "No praises sung, no eating."

"If you mean dispense with their services, I'd say that such a course wouldn't be practical," Bill said. "If you mean that they wouldn't eat because their company might go out of business, I'd say that was pretty severe."

"Well it will be one or the other if they don't mend their ways," Electra said, and we let the subject drop.

"I SEE where the economists of CIO say that half a dozen families control all the industry of the country, therefore maybe these industries should be nationalized," Electra spoke from behind her newspaper.

"That may be. I don't know whether it's true or not," I countered, "But CIO isn't helping much to make it any different. In fact, all the concentration that has taken place recently might well be due to the fact that only big business can stay in business."

"How do you mean?"

"Well, from my contacts with small business owners, the problems of staying in business are getting tougher and tougher every day. The amount of extra time and extra money that must be put into coping with labor organizations, government regulations, and the constipations of all contributory services and supplies because of the same reasons, put the small operator at a devil of a disadvantage.

"The big outfit can staff with experts to handle these jobs. They have a personnel or labor relations department to study, compare and negotiate labor agreements. They have a staff to handle priorities, OPA regulations, all kinds of laws and regulations. The owner of a small business has to do all this himself, besides trying to be purchasing agent in one of the world's hardest buying markets, supervise the people working for him and do the selling and major contacting of his customers. After a few years of that kind of gaff he's ready to sell out to a big competitor and one more independent business goes out of existence."

"But," said Electra, teasingly, "I thought all of this regulation and regimentation of business was supposed to be to protect the small business man."

"That, like the CIO economics professors' reasoning, is what an engineer might call, 'skin effect.' It is a surface conclusion. It does not take into account the current flow that causes it. Nearly all of the so-called economics of today appears to me to be like that."

"You are getting too technical for me," said Electra, diving among the ads in the shopping news. "All I know about big or little business is that the little stores never seem to have what I want, but the big stores do. Look at this ad for Sears. Why you'd never think there was any shortage of things at all. It's no wonder that people flock there to shop. You just ought to see the crowds."

"Yes," I said. "Contractors wonder why it is these chains have all kinds of wiring materials too that they can't get from their wholesalers for love or money."

"Well, what's the answer to that?"

"More realistic cause and effect. These outfits make such an attractive, simple, single market for a manufacturer, so free of a multitude of bookkeeping items and government forms—just one transaction with one big customer to provide his whole market or almost all of it—that he just can't help favoring such a buyer.

"It all adds up to the fact that the more complicated government and labor make the running of business, the more it is going to drift into large concentrations that are equipped to cope with big government and big labor."

SOME queer things can happen when people responsible for direct mail lists fail to check them properly. This scribe still is suffering from the kidding aimed at him by Electra as well as the folks in the office caused by one such carelessly thought out campaign. The envelope was correctly addressed "Mr." But the letter inside started out with this salutation:

"You are a very fortunate mother."

SOLAR PROUDLY PRESENTS

SUPEREX

A NEW

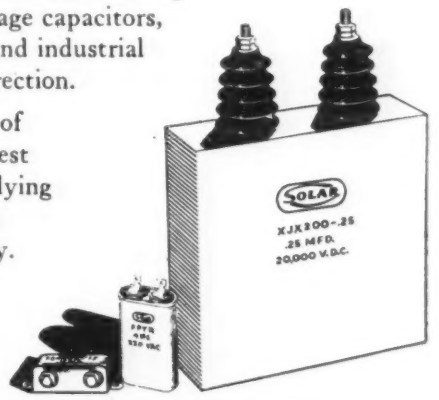
Capacitor Dielectric

SUPEREX*, Solar's superb new oil-impregnant for paper dielectric capacitors, is the result of a long-time program of research and development. Its entry into mass production under rigid standards of quality control marks another Solar contribution to the electrical industry.

SUPEREX gives to the electrical industry a capacitor dielectric material with the following outstanding properties: 1. Low Power Factor; 2. Long Life; 3. High Flash Point; 4. Non-Inflammability; 5. Non-Corrosiveness; 6. Stabilized for Operation at High Temperatures, 85°C for DC, 75°C for AC; 7. High Insulation Resistance; 8. High Dielectric Constant.

NOW available to the electrical and electronic manufacturing industries after months of heavy pilot plant production and test by leading capacitor users in the United States, **SUPEREX** stands forth today as the ideal capacitor impregnant for most applications. Tests by those who have already used **SUPEREX** capacitors have won this new material unqualified approval. **SUPEREX** assures outstanding performance in motor phase-splitting capacitors, energy storage capacitors, all light and heavy-duty capacitors used in communication and industrial electronic equipment, and in capacitors for power factor correction.

SOLAR has now completed a new plant for mass production of **SUPEREX** capacitors. This ultra-modern plant with the latest developments in high-vacuum processing equipment, is supplying daily increasing quantities of **SUPEREX** capacitors to those who need the utmost in capacitor performance and reliability.



SOLAR will be glad to tell you how you can utilize the advantages of **SUPEREX** capacitors in your applications. A letter today will bring you the benefit of Solar's authoritative experience in solving capacitor problems.

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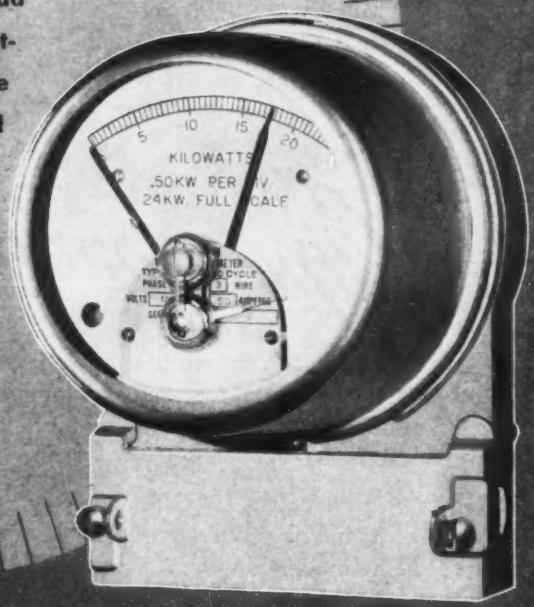
SOLAR

MEASURED DEMAND

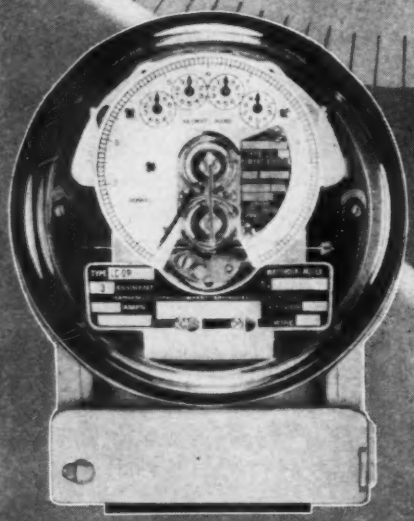
—THE INCENTIVE FOR LONGER HOURS USE

When hours of use of existing kva system capacity are increased by the addition of off-peak loads, kwh costs are lowered. Because this type of load increases revenue without increasing investment, it results in savings. A low energy rate which accompanies separate billing for fixed charges through MEASURED DEMAND is a positive incentive for longer hours use and the resulting lower average kwh cost. An extensive line of Sangamo Demand instruments is available to fulfill simply, accurately, and economically the requirements of your rate schedules.



TYPE WDP

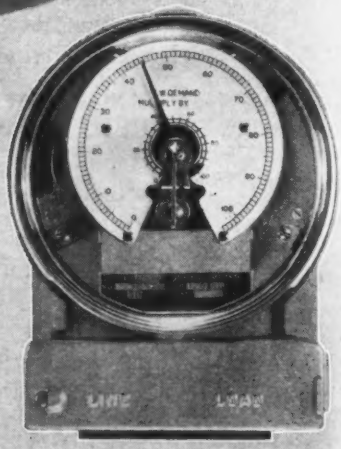
Sangamo Lincoln-Type WDP Watt Demand Meters are ideally adaptable to existing watthour meter installations. They are supplied in two-element construction for 3-phase, 3-wire; 3-phase, 4-wire Wye; and 3-phase, 4-wire Delta circuits.



TYPE LC-2P WITH LG DEMAND REGISTER

Sangamo Type LC-2P with LG Demand Register provides for measurement of kilowatthours and kilowatt demand where a simple and compact unit is required.

Type AG Demand Instruments are operated from contacts in watthour meters to indicate the maximum demand from one or more circuits.



TYPE AG DEMAND INSTRUMENT

SANGAMO ELECTRIC COMPANY
SPRINGFIELD • ILLINOIS

"HANG THE SKY".. for better lighting results

...for you and your customers

..you can do it with

Over-ALL Lighting

by Wakefield

Ideal for This picture suggests a new aim for you in lighting interiors—to "hang the sky" for smooth, even, diffused lighting in OFFICE, STORE, DRAFTING ROOM or SCHOOL. To create lighting as pleasing and comfortable for eyes as nature's sky. That means engineered lighting . . . Over-ALL lighting by Wakefield!

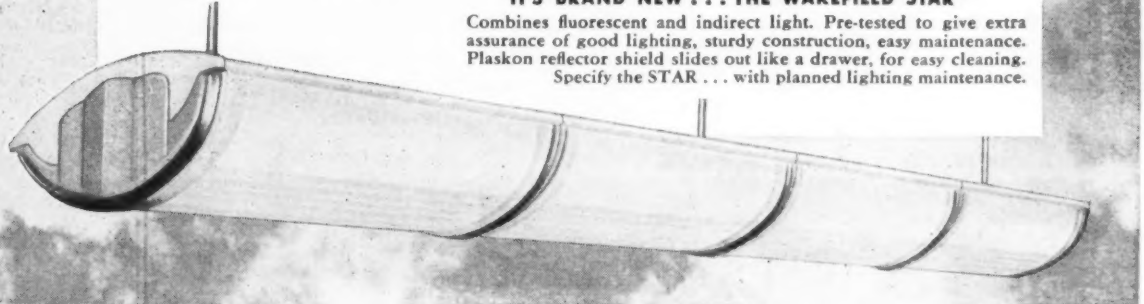
You can achieve it with any Wakefield lighting equipment . . . for Over-ALL lighting is based on "seeing" results. And the Wakefield line is engineered for top lighting performance, efficient service. Incidentally you'll find that the new Wakefield lighting equipment will have it *over* all others for sturdy construction, for ease of installation (with completely interchangeable parts) and for ease of servicing and maintenance . . . to help your customers get and *keep* full lighting value. Get the details on Over-ALL lighting from your local Wakefield representative. Or write for a copy of our new catalog No. 46. The F. W. Wakefield Brass Company, Vermilion, Ohio.

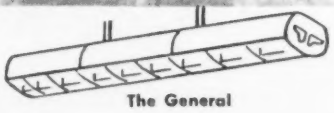
Wakefield

LIGHTING EQUIPMENT FOR OFFICE, STORE, SCHOOL, DRAFTING ROOM

IT'S BRAND NEW . . . THE WAKEFIELD STAR

Combines fluorescent and indirect light. Pre-tested to give extra assurance of good lighting, sturdy construction, easy maintenance. Plaskon reflector shield slides out like a drawer, for easy cleaning. Specify the STAR . . . with planned lighting maintenance.





The General

The Grenadier

The Commodore

The Beacon

Elevation 13,500 feet...

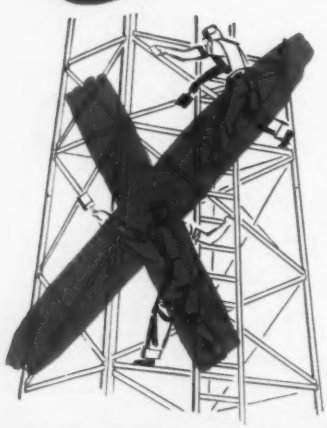
AND TOUGH GOING TO GET THERE . . . WOULD BE A "NATURAL" FOR TOWERS OF ALCOA ALUMINUM

The lighter weight of Alcoa Aluminum structural shapes greatly simplifies the transportation of materials to sites like this. It makes erection easier, too—facts well worth remembering when you're designing towers for out-of-the-way places.

Even if you don't have a right-of-way over this kind of country, there's another way Alcoa Aluminum can simplify your operation.

Aluminum is highly resistant to corrosive attack; it normally needs no protective painting. Use Alcoa Aluminum structural shapes, therefore, in the upper portions of your towers and eliminate the need for costly and hazardous painting.

Designers and operating men interested in this idea may obtain full data on Alcoa Aluminum structural shapes through the nearby Alcoa office. Or write ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh 19, Pennsylvania.



Aluminum normally needs no protective painting.

ALCOA FIRST IN ALUMINUM

IN EVERY COMMERCIAL FORM

ELECTRICAL WEST

OCTOBER, 1946
VOL. 97 NO. 4

MORE POWER FOR THE WEST

Faced with record load demands caused by population and industrial growth, Western power systems will add 2,573,375 kw. of new generating capacity by 1949

UNPRECEDENTED load demands stemming from new population, new industries, new stores and new farms have touched off the greatest power system expansion program in the history of the Far West. Utilities plus agencies of the federal government will bring in a total of 2,573,375 kw. of new generating capacity by the end of 1949 to serve the expanding requirements of electric customers. This is a 30% increase in the power-producing facilities of this region.

Gloomy predictions of 1944's postwar prognosticators that the West would have a "detour through purgatory" before its reconversion difficulties were resolved, have not materialized. Instead population continues to grow, construction is expanding, there is a shortage of workers, retail sales are at an all-time high, the farmers' income is double its prewar total. The number of workers employed in industry is almost half again as large as in the prewar year 1940.

Population growth (the West now has 16,400,000 people), abundant undeveloped natural resources and wartime increases in industrial potential and raw materials account for the stream of new industries, stores and businesses and the thousands of expansions of existing enterprises that rise from one end of the Pacific Coast to the other. The list of names reads like pages from an industrial Blue Book.

In terms of electrical demands here is what the population increase and industrial and business growth requires of the utilities: (1) Provision of facilities for serving 1,000,000 new residential occupancies, which if wired to something approaching today's standards of adequacy would represent an additional $200,000,000 electrical installation market. (2) Supply ample electric power for a $500,000,000 industrial and business development program. (3) Furnish electricity to $330,000,000 in new appliances, which represents the present untilled customer demand for the eleven Far Western states. (4) Provide facilities for 100% service to the unelectrified rural areas of this region.

The new capacity which will provide energy for these additional load demands will be distributed as follows:

	Kw.
Pacific Gas and Electric Co.	378,375
So. California Edison Co...	275,000
Los Angeles Bureau of Power & Light	290,000
San Diego Gas & El. Co....	50,000
City of Pasadena	35,000
City of Burbank	20,000
City of Glendale	20,000
Central Arizona L.&P. Co	33,000
California Oregon Power Co.	40,000
Idaho Power Co.	85,000
Public Service Co. of Colo.	47,000
U. S. Bureau of Reclamation	1,300,000
TOTAL	2,573,375

More than a million kilowatts of this total will be in steam turbogenerators located in the Pacific Southwest and in Colorado. All of the new capacity in the Pacific Northwest will be hydro.

The Pacific Gas and Electric Co. program, which is set forth in detail in an accompanying table, is part of a $160,000,000 development for expanding and improving facilities for the production, transmission and distribution of gas and electricity planned for completion by the end of 1948. Commenting on the program, J. B. Black, PG and E president, says:

"The industrial and population growth of California since the beginning of the war has increased the demand for service to such an extent that every city and nearly every small town served requires increased facilities. To meet this heavier demand, substations are being enlarged, new substations are being built, additional transmission and distribution lines are being constructed and equipment which could not be overhauled or expanded during the war years is being rebuilt, supplemented or replaced."

The PG and E expansion will increase the number of power houses by two to a total of 68 (54 hydro and 14 steam) and will bring system capacity up to 2,102,941 kw., of which 921,000 kw. is in steam generating facilities. The program does not include the projected Bear River hydro plant of 33,000-kw. capacity to be built in Amador County as part of the Mokelumne River development. An application for its construction has been filed but it is not expected to be built until after 1948.

Southern California Edison Co. is installing two 60,000-kw. steam units in its new Redondo Beach station which will be ready for operation in the latter part of 1947. In addition a 35,000-kw. hydro unit is being added to the Big Creek No. 3 power house, also for operation in late 1947. W. C. Mullendore, Edison president, states that a third 60,000-kw. steam unit for Redondo Beach is under consideration at the present time and that there is every likelihood that the station will contain four units of that size by the end of 1949.

Projected Additions to Generating Facilities—Pacific Gas and Electric Co.
1946-1948 Inclusive

Project	Operation	Installed Capacity New Plants	Additional Installed Capacity Existing Plant	Estimated Cost	Scheduled Date of Completion
Electra power house*, N. Fork Mokelumne River	Hydro	99,000 kw.	.....	$15,930,000	December 1948
West Point power house, N. Fork Mokelumne River	Hydro	15,000 kw.	.....	4,000,000	December 1948
Station P power house, San Francisco	Steam	.....	200,000 kw.	24,582,000	November 1948
Kern power house, Bakersfield	Steam	75,000 kw.	.....	12,890,000	December 1947
Eureka power house, Eureka	Steam	.....	9,375 kw.	478,000	May 1947
Additions to Peak-Load Capacity					
Pit 1 power house, Pit River	Hydro	.....	32,000 kw.	$ 940,000	July 1947
Potter Valley power house, Russian River	Hydro	.....	4,200 kw.	75,000	April 1948

* Present Electra plant to be retired—capacity 20,000 kw. The net addition will be 79,000 kw.

Plans of the Los Angeles Department of Water and Power are set forth by C. P. Garman, chief electrical engineer and deputy general manager, as follows:

"A program of capital expenditures contemplating an estimated $101,000,000 construction schedule over a period of seven years was submitted by the power system and approved by the Board of Water and Power Commissioners in December 1944. This program was based upon the then-current expectation that the end of the war would bring a considerable decrease both in peak demand and in kilowatt-hour sales. One of the principal projects of this program was the expansion of generating facilities at the Harbor steam plant, where the first 65,000-kw. unit went into operation in June 1943. This plant, when completed, will be composed of five units totaling 355,000 kw. Unit No. 2 will be of 65,000-kw. capacity, and Units No. 3, 4, and 5, of 75,000-kw. capacity each.

"The all-time peak demand at our system load centers amounted to 616,000 kw.. and occurred in December of 1943. This demand included 115,000 kw. at the aluminum reduction plant, which had been closed down completely by the fall of 1944. Despite loss of this load, and contrary to expectations, peak demand in December of 1945 was only 2.4% below the all-time high, and our estimates for the peak of December 1946, indicate that it will be approximately 2.3% above the December 1943, demand.

"To meet this condition, our program of expansion of generating facilities has been speeded up from two to three years. Foundations are in and the steel superstructure almost completed for unit 2, which is scheduled to go into service in the fall of 1947. Contracts have been awarded for the generating units, boilers, and the bulk of auxiliary equipment for the three larger units, with No. 3 and 4 scheduled to go into service by the fall of 1948, and No. 5 in the spring of 1949.

"In addition to the steam plant expansion, we are now planning to install additional facilities at Boulder power plant, primarily for use of the state of Nevada. No contracts have been signed, and these installations could not be completed before 1949. Our plans for development of additional hydro plants in Owens River Gorge are in preliminary planning stages only, and will probably not materialize for several years.

"In spite of the anticipated heavy demands on our electric system, we are confident that the provisions for additional generating capacity will be adequate. Electric utilities in southern California already have numerous interchange facilities and more are planned for the future. These connections will enable us to better take care of unexpected loads in this area."

Municipal systems in southern California will add a total of 75,000 kw. of new steam powered generating equipment to supplement present energy supplies from Boulder Dam. Pasadena has scheduled the installation of a 35,000-kw. unit and Glendale and Burbank will each add a 20,000-kw. machine in their existing stations.

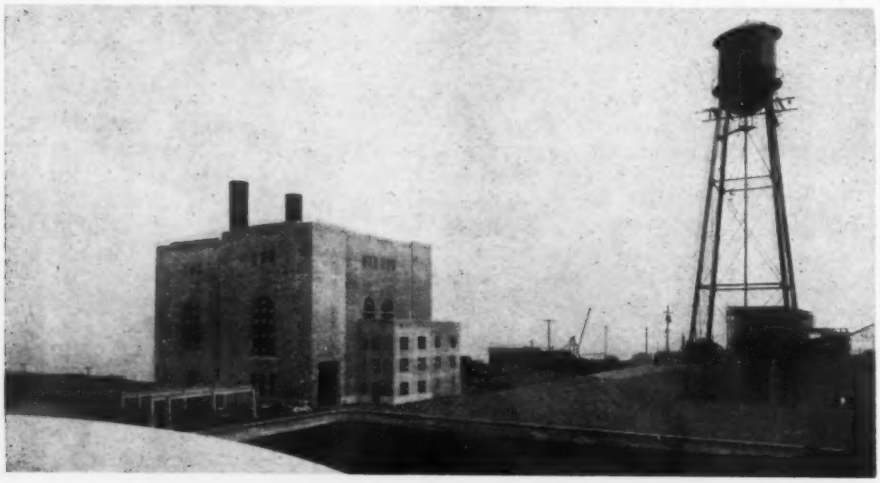
San Diego Gas & Electric Co. has under construction an addition to its Silver Gate steam station which will house a 50,000-kw. turbogenerator scheduled for completion about Nov. 1, 1947.

A 33,000-kw. steam turbogenerator will be added to the present Phoenix steam plant by the Central Arizona Light & Power Co. The installation is scheduled for completion prior to the summer of 1948.

California Oregon Power Co. has started construction of a 40,000-kw. hydro station at Toketee on the North Umpqua River in Oregon. An initial 25,000 kw. will be installed. The station is one of six on this watershed for which preliminary surveys have been undertaken. The first two units coupled with the necessary transmission facilities are estimated to cost $3,200,000.

Idaho Power Co. has four hydro projects under construction, two on the Snake River and two on the Malad River, as follows:

Power Plant	Size (kw.)	Expected Date of Completion
Upper Salmon, Units 3 & 4	16,500	Spring 1947
Upper Malad	7,200	January 1948
Lower Malad	13,500	April 1948
Lower Salmon, Units 3 & 4	30,000	August 1948
Units 1 & 2	30,000	June 1949



Station P on San Francisco Bay where Pacific Gas and Electric Co. will add two 100,000-kw. steam turbo machines

The new Lower Malad plant will replace an old 5,000-kw. installation, while the new Lower Salmon station, with a total capacity of 60,000 kw., will do away with an old installation of 7,200 kw. The total net addition to the system will be 85,000 kw.

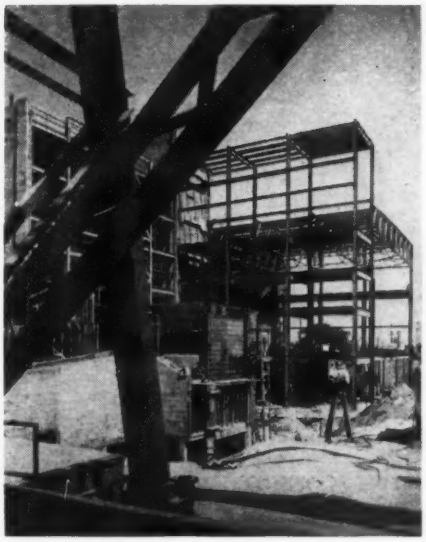
Outlining the situation in the Mountain States, J. E. Loiseau, president of the Public Service Co. of Colorado, says:

"We are confronted throughout this whole area, not only in our own company but in all others with whom I have talked, with a rate of growth in capacity requirements which is substantially in excess of any reasonable anticipations which we could have made. This has involved the consideration of additional generating capacity, as follows:

"In our existing Grand Junction steam plant we propose to install a 7,000-kw. addition, which, barring unforeseen difficulties, should be in operation in the late fall of 1947. At our steam plant in Alamosa, Colo., we have placed orders for and will install in the spring and early summer of 1947, a 5,000-kw. addition. At the Lacombe steam generating plant in Denver, we have placed orders for and will install a 35,000-kw. addition, which should be in operation sometime in the spring of 1948.

"All of the above mentioned are steam power plants, and when they are completed will assist us very materially in our reserve requirements until such time as other sources may be available."

Plans of the Pacific Northwest utilities for future generating capacity are indefinite pending a decision on the part of the Bonneville Power Administration regarding long-term power contracts. If BPA enters into long-term contracts which will indicate acceptance on its part of the responsibility of serving as the principal source of generation for the area, then the situation in that region would be settled.



Los Angeles Department of Water & Power Harbor station will house five units totaling 355,000 kw. capacity.

It is known that several of the utilities have programs in mind involving both new steam and hydro facilities in case satisfactory agreements cannot be reached with BPA.

In the meantime the U. S. Bureau of Reclamation has scheduled the installation of six additional 108,000-kw. hydro units for Grand Coulee power house to be completed by 1949. The complete USBR program for new generating facilities in the eleven Western states is detailed in the accompanying table. The total capacity to be provided, all hydro, is 1,300,100 kw. spread over generating plants in seven states.

Power requirements of the Northwest beyond 1949 will be in the hands of the Army Engineers. Col. G. J. Zimmerman, deputy division engineer at Portland, Ore., says:

"As you know, recent presidential orders have placed a moratorium on construction of federal works projects and limitations on expenditures on such works under jurisdiction of the various governmental agencies. Consequently, I am unable to furnish you at this time with a definite schedule of completion dates of projected new generating facilities. Prior to the moratorium and on the basis that sufficient funds were made available, our construction plans were predicated on meeting the power requirements of the Bonneville Power Administrator.

"There are tabulated below the authorized projects involving power, the total number of units to be installed, and the total capacity.

Project	Total No. Units	Total Installed Capacity (Kw.)
Columbia River at Umatilla, Ore. and Wash. (McNary Dam)	14	966,000
Snake River, Ore., Wash., and Idaho	Number of dams and units not finally determined.	536,000*
Columbia River at Foster Creek, Wash.	15	960,000

* Estimated initial installation.

"Additional upstream storage, if and when realized, will make the installation of additional units possible at the Snake River plants, and provisions will be made for additional units. None of the above units will or would have been installed and ready for operation during the calendar years 1946 to 1949, inclusive."

Not included in any of the totals but occasioned by the same load conditions affecting the other Northwest companies, is the program of the B.C. Electric Railway Co. Three 45,000-kw. units are being installed at its new Bridge River hydro plant. The first will be in operation in June 1949.

United States Bureau of Reclamation

Projected New Generating Facilities Scheduled to Be Completed During Years 1946, 1947, 1948 and 1949

Name of Power Plant	Location	Steam or Hydro Plant	New Plant or Addition to Existing Plant	Size of Installation (Kw.)	Scheduled Date of Completion Year
Anderson Ranch	20 miles northeast of Mountain Home, Idaho	Hydro	New	27,000	1948
Grand Coulee	94 miles west of Spokane, Wash.	Hydro	Addition	108,000	1947
Grand Coulee	94 miles west of Spokane, Wash.	Hydro	Addition	216,000	1948
Grand Coulee	94 miles west of Spokane, Wash.	Hydro	Addition	324,000	1949
Addition to Cove Plant of Pacific Power & Light Co.	On Crooked River near Culver, Ore.	Hydro	Addition	1,500	1946
Shasta	12 miles north of Redding, Calif.	Hydro	Addition	150,000	1947
Shasta	12 miles north of Redding, Calif.	Hydro	Addition	75,000	1948
Keswick	4 miles northwest of Redding, Calif.	Hydro	New	75,000	1947
Davis	On Colorado River 67 miles below Boulder Dam	Hydro	New	225,000	1949
Heart Mountain	4 miles west of Cody, Wyo.	Hydro	New	5,000	1948
Kortes	28 miles southwest of Casper, Wyo.	Hydro	New	40,500	1949
Mary's Lake	3 miles southwest of Estes Park, Colo.	Hydro	New	8,100	1949
Estes	Estes Park, Colo.	Hydro	New	45,000	1949

Selling the West to Industry—1

B.C. Electric Railway offers industry specific aids and services. Its advertising, tuned to British Columbia's growth, seeks industrial prospects as far away as London

J. E. Underhill
Director of Industrial Development
B. C. Electric Railway Co.

EARLY in 1945, as it became apparent that World War II would soon end in success for the United Nations, the B.C. Electric Railway Co. decided to consider the problems incident to reconverting the greatly expanded war industries in the territory served. In January 1945 the Industrial Development Department was created and its efforts directed toward the following:

1. Exploring profitable fields of production to which wartime industries might reconvert for peacetime production.

2. Preparing an inventory of the special advantages which industries, both established and new, enjoy in this area.

3. Preparing factual data regarding available industrial sites, to include information in regard to railway and shipping facilities, taxation, essential services of water, sewer and roads, market surveys, production costs, availability of new materials.

4. Studying the possibility of making new products from raw and waste materials peculiar to this area.

5. Providing industrial research facilities which should be of major benefit to local industries.

National Ad Campaign

A study of the wartime shift in population (Table I) made increasingly clear the necessity for our creating more secondary industries in B.C. to provide profitable peacetime employment for the additional 90,000 people. It was generally admitted that the newcomers would prefer to stay and live in B.C. if they could locate suitable work. In addition to the wartime increase, our population was definitely augmented by discharged personnel from the services, a considerable proportion of whom did not enlist from this province.

It was considered that our best contribution to the problem of inducing new industries to locate in B.C. would be to carry out a national industrial advertising campaign, designed to bring to the attention of executives of eastern Canada, the United States and the United Kingdom, the opportunities for industrial expansion in British Columbia.

A great deal of attention is being attracted to B.C. as a result of these advertisements which employ the theme "Business is Moving to B.C." This campaign is still in progress. These advertisements cover Climate, Power, Pacific Trade, etc. Some were run in the *London Economist*. Some, in Quebec, were run in French.

Illustrations throughout these pages devoted to industrial advertising are pages from the Los Angeles Department of Water & Power's elegant and excellent booklet, "F. O. B. Los Angeles."

To answer general inquiries thus initiated, a map-brochure *Business is Moving to B.C.* has been prepared. This gives in general terms, statistical information about B.C. and the industrial potentials of the province.

Table II shows media used and coupon inquiries to date. To impress upon our local residents the importance of this national campaign, two pamphlets have been circularized.

Community Action

Closest cooperation has been maintained with governmental and municipal authorities together with public bodies such as the local boards of trade, service clubs, etc., with a view to making a coordinated effort to maintain and improve our economic status by rendering any service to business and industry which might be a factor in their successful operation. The officials of each municipality and board of trade in the territory which our company serves, were specifically approached and requested to carry out an industrial survey of their community. Every assistance has been rendered to these bodies and they have been provided with an outline for A Community Industrial Development Program to assist them in this work. Successful results from these endeavors are being achieved.

Availability of Power

With the firm belief that British Columbia is to enjoy an industrial development far in excess of any similar development which it has experienced in past years, the B.C. Electric has taken steps to provide an additional new source of electrical power, the Bridge River hydroelectric power development. Contracts have been let for building the storage dams, steel for the transmission line towers, and other factors upon which a firm engineering decision has been made. Additional contracts will be let for the hydraulic units, electrical generators, transformers and switchgear, etc., as the final plans for the initial development are approved. Present plans call for Bridge River power to be made available in the lower mainland area during 1949. To insure ample power during the interim, connection is being made with the Northwest Power pool. It is planned to have this power available late in 1946 or early in 1947. A fifty million dollar expansion program is involved.

Specific Aids to Industry

The industrial development department has compiled extensive files to make it possible to provide specific information on the following matters:

1. The location of available industrial sites, property values, taxation.

2. Cost and availability of essential services, such as water, sewer, light and power, gas, transportation, etc.

3. Market surveys covering both the domestic market and the potential export markets. This involves a study of freight rate schedules and express charges.

4. Authentic statistical information regarding population growth, labor costs, raw material costs, etc., essential to the economic study of any proposed business enterprise.

Here is a specific example of how this information is applied. The Dominion Bureau of Statistics issues authoritative statistics showing the geographical distribution of manufacturing industries in Canada. These figures show that B.C. has 8% of Canada's total population, produces only 6.8% of the furniture produced in Canada, imports more furniture than it exports.

The fact that the lumber industry is British Columbia's major primary industry would lead one to believe that we should have more than our relative weight by population of furniture manufacturing factories in B.C. Statistics indicate that this is not so. It is a fair assumption, therefore, that there is a particularly good opportunity for the introduction of new furniture factories in B.C. Our efforts are therefore directed to bring this about.

Special studies are made with respect to determining raw material sources peculiar to B.C. In this regard mention might be made of the big demand for agricultural lime required by our extensive farming community in the Fraser Valley. Because our major lime-producing plant was diverting most of its product to the building trades and the export market, our farm lands were becoming hungry for lime. The productivity of our farms was threatened. As a result, new limestone deposits have been located and plans made for the development of the same.

Table I—Population Shifts

(June, 1941, to April, 1944)

Province	Change
British Columbia	+ 90,000
Saskatchewan	— 84,000
Ontario	+ 58,000
Manitoba	— 24,000
New Brunswick	— 18,000
Alberta	— 17,000
Quebec	— 12,000
Nova Scotia	+ 10,000
Prince Edward I.	— 8,000

The B.C. Electric promotes the sale of products manufactured by British Columbia industries by arranging industrial window displays in its showroom windows located on the leading street in Vancouver. These displays portray the activities of the firm, the pay roll involved and the products manufactured. These window displays have stimulated the sale of these B.C.-made products and in the case of many small industries have doubled or trebled their sales. In some cases, contacts have been made with out-of-town buyers who had been vacationing in Vancouver and who noticed these window displays.

The B.C. Electric, in cooperation with other member companies of the Northwest Electric Light & Power Assn., has made available Research Advisory Service, which is offered to promote the development and expansion of British Columbia's industrial and agricultural enterprises. This service is designed to provide at no cost to the company concerned, authentic technical information which may be an important contribution to each company's further development and progress.

Results

It is difficult to make an accurate appraisal of the short term results obtained from industrial promotion work. The following figures do, however, show the tremendous activity already under way.

	B.C.	Ontario	Quebec
Relative Weight Population (1944)	7.8%	33.2%	29.3%
Industrial Construction Contracts Awarded in May, 1946 (last published), thousands	$7,411	$3,550	$6,704

Conclusion

British Columbia is in the throes of an unprecedented industrial expansion. B.C. Electric in order to serve our industrial power customers more adequately, has embarked upon an extensive program of power development. There will be no doubt that the company can provide an abundance of cheap power for our expanding industries in the years to come. At the moment, emphasis is placed on rendering assistance in the establishment of new secondary industries and reconverting existing industries on to a peacetime basis. The object is to provide employment for our increased population. From the results to date it would appear that our industrial promotion efforts are achieving results beyond expectation.

During the first seven months of this year, in our lower mainland system, existing industries added 10,111 hp., and 65 new industries added 6,100 hp. As of July 31, there were specific prospects for another 16,000 hp.

Table II—B.C. Electric Industrial Campaign, Media and Supplies

1. MEDIA

(a) First Campaign (September, 1945, to March, 1946):
- Fortune
- Toronto Saturday Night
- Financial Post
- Time
- Wall Street Journal
- London Economist
- Montreal Gazette
- Toronto Globe and Mail

(b) Second Campaign (March to September, 1946):
- Time
- Fortune
- New Yorker
- London Economist
- Canadian Mining Journal
- Canadian Business
- Montreal Gazette
- Junior Board of Trade Actional Annual
- Montreal La Presse
- Toronto Globe and Mail
- Financial Post
- Saturday Night
- Industrial Progress
- World Report (published by United States News)

2. COUPON INQUIRIES RECEIVED

(a) Total to August, 1946..... 1,566

(b) Countries from which inquiries have been received (other than Canada and the U. S. A.):

Alaska	Iraq
Argentina	Lebanon
Australia	Mexico
Belgium	Netherland West Indies
Brazil	Newfoundland
China	Northwest Territories
Cuba	Orkney Islands
Denmark	Puerto Rico
Egypt	Scotland
England	South Africa
Holland	Sweden
India	Venezuela
Italy	Yukon

TOTAL 26

(c) States in the U. S. from which inquiries have been received:

Alabama	Missouri
Arizona	Nebraska
Arkansas	New Hampshire
California	New Jersey
Colorado	New Mexico
Dist. of Columbia	New York
Florida	North Carolina
Georgia	Ohio
Illinois	Oklahoma
Indiana	Oregon
Iowa	Pennsylvania
Kentucky	Rhode Island
Maine	Tennessee
Maryland	Texas
Massachusetts	Virginia
Michigan	Washington
Minnesota	Wisconsin

TOTAL 34

(d) Business inquiries received to August 1946 96

Selling the West to Industry—2

Los Angeles' Department of Water & Power carries the ball for the City's industrial future. National advertising, based on regional fact finding, is attracting prospects

*O. K. Buck**

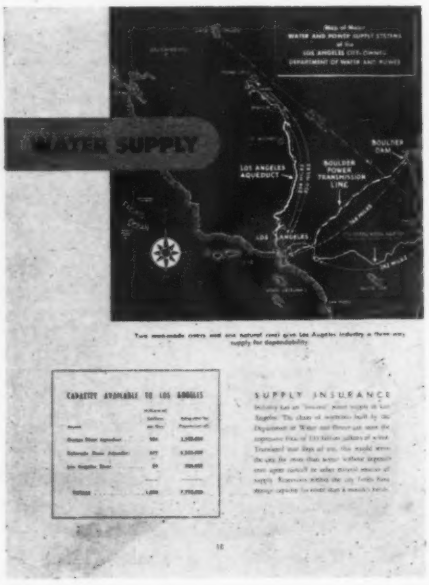
FOR many years Los Angeles has been in the position now becoming characteristic of the West as a whole—that of having industry follow population. The dislocations of the community's over-all economy which could arise if industrialization lagged too far behind the population growth were recognized several years ago, and as a result there sprang up in the community a school of thought which urged taking vigorous steps to accelerate the industrial growth of the region.

This background led the Department of Water & Power to an early interest in efforts to attract industry. While this could not logically develop into an all-out effort until recently, it did guide planning to the point where the department found much of the ground work accomplished when first the war, and now the spectacular Westward trend, thrust it into the position of being the leading sponsor for selling Los Angeles to prospective industries.

All this is not to say that industrialization is lagging in the Los Angeles area in the general sense of the word. So much the contrary that Los Angeles' industrialization in the last few years is perhaps the most spectacular in the nation. The following summary of wage earners employed in manufacturing in the Los Angeles industrial area may serve as an index of this spectacular growth:

Year	Wage earners employed in manufacturing
1940	152,800
1943	454,200
1944	419,100

The Department of Water & Power's present industrial program really had its beginning just before the war. It was realized that if industrial mobilization was to come, the West Coast, initially, and at that time, could contribute effectively only by means of its combined plant, since individual manufacturing plants, in general, were comparatively small. Accordingly, the Department began setting up procedures for collecting industrial information and was a step ahead of the game when OPM stated an immediate need for data on machine tool facilities. Agreement was quickly reached on the extent and form of desired information, plants were surveyed, the information coded on tabulating cards and for the first time coherent data were made available on just what facilities



were in the area and where. As a result, it was possible quickly to locate plants with machine tools suitable for specified products and thus, through subcontracting and in other ways, gain maximum efficiency in minimum time.

The usefulness of such information led to studies of available industrial floor space and available industrial sites—studies which are continuing today. The latter led in turn to studies of available land, municipal zoning laws, traffic considerations, and similar factors bearing on industrialization.

This general effort to provide informational services both for new and existing industries underlies the present promotion program as a whole. Before the end of the war, as it became evident that the general industrial effort was likely to come to an end, the department sent a questionnaire to all industrial plants on its lines, inquiring as to their postwar plans. One immediate effect of the query was to stimulate reconversion thinking—many plants had given it no thought up to that time. Information gained through the inquiry later became useful in assisting these same plants in converting to peacetime production.

Main effort of the present industrialization program is through national advertising. This fiscal year, $80,000 is being devoted to space in *Business Week, U. S. News, Forbes, Fortune, The Wall Street Journal* and trade magazines.

In broad terms, the most appealing features of Los Angeles to prospective industries may be classified as climate, market and rate of growth. Along with these go the factors which tend to attract industry to any region—labor supply, raw materials, facilities available, etc.

The national advertising has as its immediate objective the attracting of responsible inquiries. As an incentive, a brochure was offered to interested prospects.

In producing the brochure every effort was made to combine visual attractiveness with simple and vivid, but detailed facts. It was felt that the extra cost of producing a very high-quality presentation could be largely offset by confining distribution to bona fide prospects, in this way getting, in the end, far more effectiveness per dollar. Reaction to the brochure, which is entitled *F.O.B. Los Angeles*, appears to bear out this belief.

The brochure opens with an invitation to the city, tells briefly about the trend West, interprets this in terms of labor supply, presents geography of the city, both within itself and in relation to Pacific markets, emphasizes climate and culture as they bear on working conditions, then takes up water supply, power supply, raw materials and transportation.

By early this autumn, the national advertising in publications had produced 1,380 inquiries.

In addition to publication advertising, the department has participated in two expositions: the metals show in Cleveland in February and the chemical show in Chicago in September. When department representatives have traveled east for occasions such as these, small display space has been used in financial papers to announce their availability for furnishing data on Los Angeles. Inquiries resulting from such advertising have been extremely limited, but of good quality.

On the home front, the department is endeavoring through representation both on city and state chambers of commerce, and by close liaison with other agencies, to secure maximum coordination and to develop widespread

* Manager of Industrial Sales, Los Angeles Dept. of Water & Power.

interest in efforts to secure industry for the area.

Utilizing techniques previously applied in the machine-tool and floor-space studies—which are being kept current—the department is now engaged in a detailed survey of industrial property. The objective is to secure information on, and catalog, every available site.

At the same time, soil studies are being got under way, as well as studies concerning the merits of Los Angeles as a location for electric-furnace steel industries and electrolytic refining processes.

This is connected with the basic appeal of Los Angeles' low electric rates. It was mentioned above that electric rates were treated in some detail in the brochure, *F.O.B. Los Angeles.* While electric rates may account for only 2% to 5% of the production costs in many manufactured products they may amount to an appreciable percentage in certain specialized processes. In any event the saving is important in its effect on net profit.

In tabulating industrial power rates of the nation's 15 principal industrial centers for various typical consumptions corresponding to demands ranging from 75 kw. to 1,000 kw., it was possible to show Los Angeles area rates as lowest in every case but one, and in that case they were second lowest. While to most manufacturers this will appear only as a minor attraction, to a few it might prove decisive.

At present there are so many leads on hand that the advisory service has difficulty in keeping up with the requests. The advisory service endeavors in every way to give business the right start. It has been repeatedly demonstrated that small, new businesses can "get off on the wrong foot," leading to difficulties in transportation or relocation which subsequently penalize both the business and the community. The department's advisory service frequently can foresee and prevent such mistakes.

To whatever extent possible, promotion will be continued, both to develop prospects and to "keep the product name before the customer." To the same extent, advisory service will be made available both to new prospects and to established enterprise. By such means the department strives to influence the growth of L.A. toward an integrated, solidly based economy.

Selling the West to Industry—3

Idaho Power proceeds town-by-town to uncover the distinctively attractive features of each community; cooperation with communities at every step builds regional well-being

*Orland C. Mayer**

IDAHO Power Co.'s concept of service has always meant more than an uninterrupted flow of electricity to its customers. As "A Citizen Wherever It Serves," the company has devoted a considerable part of its time and effort outside the field of its primary function, to be a partner with other enterprises in its territory, working toward the development of the wealth and well-being of the whole area.

Prior to the war, Idaho Power's industrial development program had been busy gathering facts and figures about the Snake River Valley to help existing enterprises make additional use of the resources of the area and to encourage the establishment of new businesses and industries. This program dove-tailed with the chemurgic activity which the company helped establish in Idaho and eastern Oregon, and it assisted in the development of the chemurgy-born potato-starch factories in Idaho. In the era just prior to Pearl Harbor it encouraged and helped the development of dehydrators for agricultural produce and the establishment of several other enterprises.

When war came, the industrial development program converted. It assisted southern Idaho and eastern Oregon firms in war work changeover, providing engineering service, plant layout analysis, priority assistance and bid analysis for all who wanted it. And as war demands began to ease, the program was modified to lend a helping hand to Snake River Valley industries in planning and reconverting to peacetime activities.

Postwar Survey Needed

This peace-to-war-to-peace experience indicated the need for detailed specific information about the entire area. Prior to the war a substantial file of territory-wide statistics had been built up, but in talking expansion of present enterprises and the encouragement of new industries in the Snake River Valley, it was found that detailed studies of the individual towns and their trading areas was essential.

As a result, Idaho Power started a comprehensive industrial survey of the area, town by town. Working with city administrations and service organizations, company representatives are gathering pertinent statistics about population, production, soil, climate, services and equipment from each area throughout the entire territory. An expanding file is being prepared for the use of each community, so that additional facts can be added from time to time and the entire project kept current. A similar file is retained by the company, and a third file will be maintained in the Idaho State Chamber of Commerce offices. These statistics are being used in answering inquiries from prospective new enterprises and in soliciting new industries and businesses for Idaho and eastern Oregon.

Vale Publicity

A third step, in addition to the collecting and tabulating of the information, is the offer by Idaho Power to assist the individual towns in preparation of such publicity as they desire about their trading areas and advantages that the survey reveals. In this way the information is of greatest benefit to the communities.

* Director of Industrial Development, Idaho Power Co.

Vale, Ore., is a case in point. At the completion of the survey in that area, the Vale Chamber of Commerce decided that the information gathered could and should form the basis of an advertising booklet about Vale and the Vale area. Idaho Power cooperated in the preparation, production and distribution of the mailing piece.

A number of industries have come to Idaho since V-J Day. It is difficult to say how many of these would have come if the information supplied by the industrial development program had not been available. We do know, however, that this information has greatly assisted industries in making their decisions. In some cases it is known that industries would not have considered the area had not adequate figures been available. In the main it is a safe conclusion that results have been secured just as surely as by advertising in any form. Idaho has the raw materials, and a program of bringing the quality and quantity of these materials to the attention of prospective industries should produce good results.

A set of forms has been developed for use in the surveys conducted by our company in cooperation with civic organizations. After material is gathered, it is analyzed by local people and a resultant figure arrived at for the area surrounding their particular town. Most figures available are for counties, and do not take into consideration the fact that a town may draw from parts of several counties; thus the importance of having local people determine the amount of produce available in the area surrounding the town.

To date ten of the towns served by Idaho Power have been surveyed; one brochure has been published, three are being printed, and three are in preparation.

Selling the West to Industry—4

Pacific Gas and Electric helps the northern California area with a full-blown program which begins with fact finding, embraces national advertising, and ends with service

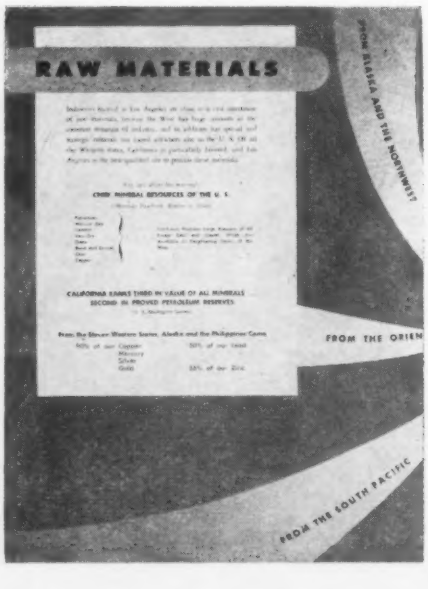
D. V. Doub
Industrial Development Engineer
Pacific Gas and Electric Co.

TOWARD the end of World War II circumstances indicated that the normal rate of increase of population in the eleven Western States plus the tremendous influx of population during the war years, had resulted in a market which would support practically all types of industry. Such a market would undoubtedly prove attractive to eastern industry, and now was the time for calling to the attention of out-of-state industrialists, not only this market, but other factors conceded to be influential in effecting the location of industry within an area. So, what had preveiously been policy now became a definite program, a program of industrial development.

Western utilities had a strong motivating reason for desiring to assist in the industrial development of the West. Most of these utilities, and certainly PG and E, had an important stake in the continued expansion and growth of industry throughout their respective service areas. For example, the sale of electric energy by this company to industrial establishments constitutes approximately half the annual sales volume. As industry flourishes so will the company's business prosper.

Not only does industry itself provide a market, but also the employees of industry provide a market, and these employees in turn require establishment of commercial enterprises to serve them. With such a pyramidal relationship founded on basic industry, it is only natural that utilities should take an aggressive position in industrial development.

Therefore, with an abiding faith that a magnificent future was surely in store for every locality within the Western Empire, and northern California in particular, PG and E went ahead with its program for industrial development. First of all, we attempted to isolate the reasons why industry locates in an area. It was generally conceded that, though there were probably between 30 and 50 influencing factors, the four most important were market, transportation, labor and raw materials. These four most influential factors might still be rearranged in varying order of importance, depending upon the type of industry under consideration, but they were undoubtedly the most basic requirements. Analyzing these factors insofar as they affected development of our territory, we found the following.



Market

The continued shifting of population Westward had resulted in approximately 16 million people then living in the eleven Western States and about 8¾ million of these were in California (now approximately 9,000,000) — a population which had an exceptionally high per capita purchasing power. Steamship lines plying in and out of the Pacific Coast ports reached over three-fourths (approximately 1 billion persons) of the population of the globe. In other words, there was now available to the Pacific Coast manufacturer a market which would sustain the economic minimum of even the more involved industries such as iron and steel.

Transportation

Facilities were now available to the Pacific Coast manufacturer which permitted him to distribute his product in competition with outside production centers. He could serve all the West from northern California, the geographical center of one of the most efficient transportation systems in the country. Three transcontinental railways, more than sixteen common-car-

rier truck lines, approximately 88 water shipping lines and many airways make our industrial area unmatched in the West for its transportation network.

Labor

California's population increased 26% from 1940, to July 1944, as a result of the war, and labor forces grew 37% from approximately 3 million to 4 million from April 1940, to June 1943. The national labor rise was only 21%. Surveys showed that many of these people who came to the state for war work planned to stay. These persons not only constituted part of our new market, but from their ranks would be drawn a portion of the labor which would be required to man the new industries established here. The physical and mental characteristics of the northern California labor supply are of an exceptionally fine order, and climatic conditions are singularly conducive to the maintenance of high efficiency.

Raw Materials

The wealth of raw materials produced in the West needs very little comment. Raw materials range from petroleum, gold, copper and other basic metals to cotton and semi-tropical fruits and include lumber and fish.

Summation of Values

It was, therefore, obvious that having the factors of market, transportation, labor and raw materials provided for on such an extremely favorable basis, the Pacific Coast had in fact become a self-contained empire in which industrial development had only begun. It may take years for the present demand to be met by local producers and, in the meantime, the population West of the Rocky Mountains continues to grow at a rate approximately 4½% a year during normal times. This rate of increase probably will be accelerated rather than decreased, so that looking ahead, it will require at least a generation of industrial development to provide for present-day needs, and another 20 years to provide for the increase in population. Expressed in plain language, this means that a ground floor opportunity exists today on the Pacific Coast for the manufacture of all types of commodities. Eastern and Middle Western producers who today are marketing their products West of the Rocky Mountains are faced with the ultimate necessity of producing at the center of distribution for this market if they expect to hold their present trade against Western manufacturers.

Our approach envisioned, first, the industrial possibilities in the West to

out-of-state industries and, second, assisting local communities to prepare their plans for accommodating industry as it decentralized Westward. We therefore embarked on a national advertising campaign to call attention to northern California's abundant possession of those factors essential to the establishment of new industries. We ran a series of six advertisements in *The Wall Street Journal, Saturday Evening Post, Forbes, The United States News, News Week and Time.* These advertisements elaborated upon the four factors previously mentioned as being most essential in influencing the location of industry, and depicted foreign markets, domestic markets, transportation, plentiful power, raw materials and labor force.

For the purpose of determining the relative importance of location factors in the minds of eastern industrialists, we had our advertising agency, Batton, Barton, Durstine and Osborne, make a survey of eastern industries' evaluation of them and were interested to discover that the results of the survey confirmed our previous findings.

It was also our desire to provide some gage for measuring the interest created by our advertisements, and it was decided that this might most effectively be accomplished by including with the advertisement a bit of text offering a free site survey service so inquiries would be directed to our company.

Site Survey

To provide this service a well trained PG and E engineering staff was developed to help industrial firms learn the facts about locating in northern California. This staff worked closely with established agencies throughout the entire area, and its service included at no charge complete information on environment, transportation, drainage, trucking and freight rates, estimated cost of property, of any necessary improvements and of power and other utilities. It also included a thorough study of available sites with photographs, maps, aerial perspectives, etc.

Inquiries Roll In

The campaign got under way as scheduled and inquiries by the hundreds commenced to arrive. These inquiries included some of such superficial nature as requests for additional copies of our national advertisements, but a great percentage were from industries desiring additional facts about locating in this area. These industrial inquiries were of a very high caliber and included requests from such firms as Anaconda Wire & Cable Co., International Harvester, Cutler Hammer, Tropical Paint Co., Cuneo Press, Grocery Stores Products Co. and many others.

These inquiries usually commence by requesting general information on various factors of the West and, after a bit of correspondence, with a request for quite detailed information on available property sites. To furnish the desired information, we prepare a report which, in many instances, includes between 50 and 70 pages of helpful material. These reports are placed in an attractive binder, include a table of contents, a letter of transmittal, maps of gas and electric transmission lines, maps of territory covered by PG and E, company sites survey data with maps of the various areas under consideration and brochures, where obtainable, of the communities or counties in which the submitted land parcels were located. These brochures permit an area to tell in its own words about the features of its territory and provide a more effective means for acquainting the inquiring industries with much of the background they desire.

When an industry's interest reaches such a point that they send a representative to the West Coast to see things first hand, we arrange to provide him with transportation to review the industrial sites under consideration and to put him in touch with banks, chambers of commerce, real estate firms, railways, etc.

Local Advertising

But our job was less than half finished. It was still necessary to inform northern Californians of what we were doing and why. To tell them of our national campaign and suggest ways in which they might personally assist toward the industrial development of this state. This educational program involved a tremendous amount of detail and was eventually worked out in such

a way that all northern California people were reached. Three segregations were made:

1. A group of approximately 3,000 which consisted of community leaders, heads of local industry and other prominent civic personalities.

2. The 12,000 or more PG and E employees.

3. The general public.

To the selected group were sent reprints of the national advertising, as they were released; and later, a copy of the national advertising brochure was sent out and PG and E employees received a broadside which explained how they, their community and their company all benefited from the national campaign, and those employees who contacted the public were furnished with additional material designed to prepare them intelligently to discuss any phase of the industrial development program.

The general public was made aware of the PG and E program through articles in their local newspapers, Western magazines and person to person promotional efforts. A special merchandising kit, containing extra reprints of the advertisements, a copy of the national advertising brochure, an employee broadside and many suggestions on how to present the subject at service groups and other local organizations, was supplied to key personnel.

All in all, results to date have been very gratifying. The high quality of inquiries attested to the value of the national campaign, and comments of people in our own territory indicate that they are cognizant of our aims, are doing everything possible to assist and are highly pleased with the program.

Aiding Community Planning

Industries are moving into every area in northern California. Many communities are discovering that there are many things which require attention to adequately supply the needs of these newcomers. There is need for direction of effort and large scale planning. and here is where PG and E is again assisting by working with these communities to help solve their problems. Company representatives are meeting with chambers of commerce, county boards of supervisors, improvement associations, service groups and other organizations interested in the orderly growth of their territory. It is being pointed out to them that to help industry get properly located and prosper there is need for a careful analysis of such factors as:

1. City planning and industrial zoning with plans designed to fix for years to come the position of highways, railroads, airports, waterways and other means of transportation, and assure that these factors are carried into county planning, regional planning and state planning.

2. Development of industrial sites or districts so that land prices may be maintained within reason and railroad spurs made available.

3. Water supply for industrial use with studies of both amount and analysis.

4. Sewerage and waste disposal systems.

5. Inventory of local manufacturers: what industries are located now in the area, what they produce, what could be manufactured economically in the area.

6. Studies of local labor forces with analysis of skills and breakdown as to numbers of men and women.

7. Publication of inexpensive brochures as local hand-out material to present pertinent facts.

Communities are urged to commence the accumulation of data on the factors just mentioned and, as soon as it is in presentable form, to make it available to utilities, railroads, banks, insurance companies, chambers of commerce and others, so that if inquiries are made by eastern industries these organizations may direct them to the areas where their type of manufacturing would be most compatable with the surrounding economy.

Much Yet To Be Done

This last mentioned job is a large one. Much remains to be done. It is going to require intelligent understanding and cooperation by everyone if the greatest results are to be achieved. PG and E intends to continue exemplifying such cooperation and contributing on an all-out basis to the growth of the West.

Selling the West to Industry — X

WHILE the four case stories provide an excellent cross-section of activities which are bringing industry West, they do not measure the full scope of the effort by any means. Even within the electric utility field can be found additional examples.

Noteworthy are the programs of San Diego Gas & Electric, Puget Sound Power & Light, and the group advertising of Washington Water Power, Pacific Power & Light and Northwestern Electric. Southern California Edison has an extensive 1947 program in the works.

Western railroads form another conspicuous group of organizations which are promoting the industrial future—particularly Southern Pacific, Union Pacific and Great Northern, all of which have been advertising nationally.

The Bank of America is outstanding in the business field with a wealth of facts and figures dealing particularly with the future of California and the West as a place to do business, manufacturing business included. Advertising and advisory service are part of the program.

The State of Washington and the Province of British Columbia are telling their respective stories well. Federal agencies, while prevented by law from conducting advertising campaigns, have turned up invaluable facts as a result of regional surveys.

By all these means the Western story is being told. Industry has at its disposal a variety of cooperative, fact-finding services which constitute a new factor in industrial planning. As a result, industry is headin' West, where cooperation is fostering swift but orderly growth.

TREND OF POSTWAR WESTERN MANUFACTURING

THE Far West's postwar industrial pattern is slowly taking shape. Despite the trials and tribulations of reconversion—strikes, material shortages, and other obstacles—employment in manufacturing industries in this region is greater by almost 600,000 workers or 65% than it was in 1939. Employment exceeds the most optimistic predictions of the earlier postwar planners, who feared that many would be jobless by now.

The chart below is based upon compilations of the Twelfth District Federal Reserve Bank and shows the percentage of total factory employment for various basic industries for typical prewar, wartime and postwar periods, in each case the first quarter of the year indicated. Most striking is the speed with which the workers in the highly inflated aircraft and shipbuilding industries were absorbed into other kinds of factory employment, giving the postwar pattern something of the same characteristics as the prewar division of workers.

Prewar and postwar comparisons for California alone reveal some startling gains which again are confounding the critics who foresaw only trouble arising from vast numbers of unemployed war workers and displaced populations. A study by the research department of the California State Chamber of Commerce using figures from the State Division of Labor Statistics shows the following increases in employment and earnings for June 1946 as compared with June 1940 for some typical durable and non-durable goods industries:

Textiles: employment, 23%; earnings, 127%.

Apparel: employment, 36%; earnings, 218%.

Paper and paper products: employment, 52%; earnings, 147%.

Chemicals and allied products: employment, 63%; earnings, 160%.

Petroleum products: employment, 63%; earnings, 152%.

Rubber: employment 123%; earnings, 275%.

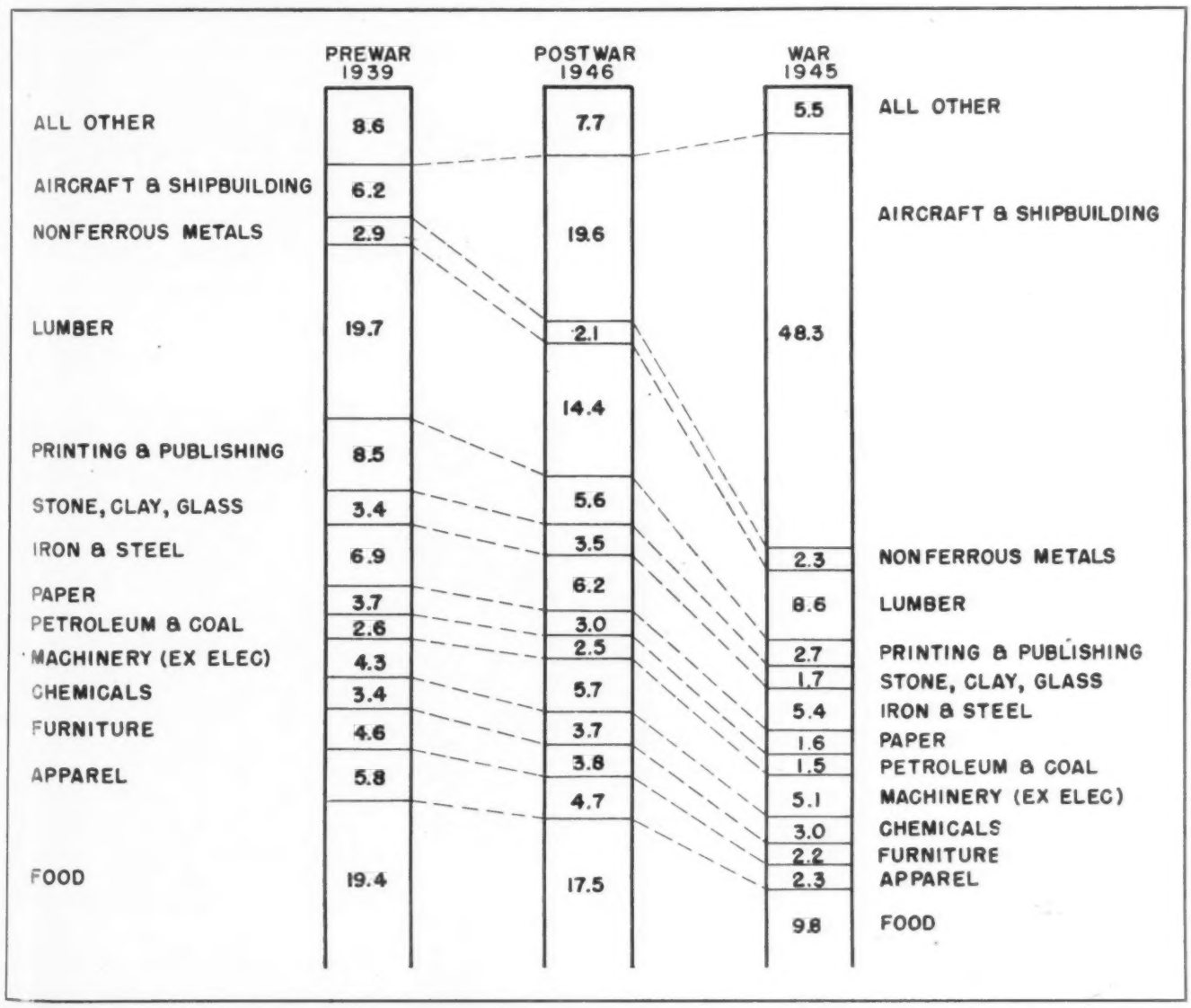
Aircraft: employment 27%; earnings, 123%.

Shipbuilding and repair: employment, 336%; earnings, 652%.

Iron and steel: employment 48%; earnings, 154%.

Machinery manufacturing, electrical equipment production, automobile assembly, cement, frozen foods, furniture, leather and leather products are other categories in which substantial gains have been made.

Both the immediate and long-term prospects for further industrial development in this area are excellent. Initially the gains will be in those industries engaged in the processing of locally produced raw materials. Ultimately the trend will be away from resource-based industries in favor of population-based industries.



Ryan Aeronautical Co.'s 43-acre plant at San Diego lies adjacent to Lindbergh Field; 8,600-ft. runway is West's largest

Welding with Atomic Hydrogen

Typical of the West's growing industries is Ryan Aeronautical Co. at San Diego. The spur of war developed new ways of welding stainless steel

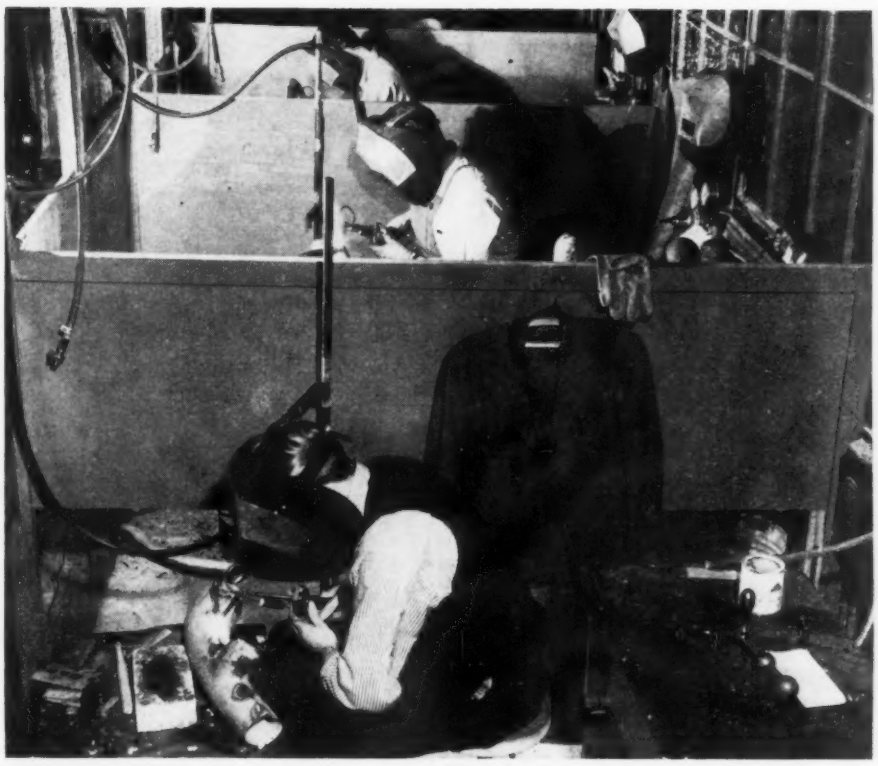
William P. Biotherton
Technical Editor
Ryan Aeronautical Co.

Illuminating gas, burned inside this long, enclosed section, prevents oxidation while welding with atomic hydrogen

TREMENDOUS strides in the field of welding were made during the high production years of the war. Notable were the welding of cargo ships, the development of magnesium welding, improved machines and electrodes, and a greater knowledge of the metallurgical characteristics of weld structure.

Prominent in this industrial achievement has been the progress made in the welding of light-gage metals by the aircraft industry. The Ryan Aeronautical Co. was one of the first aircraft concerns to adapt the atomic-hydrogen welding process to its needs. Known to possess definite advantages over other welding methods, atomic hydrogen had not been used to any extent for the fabrication of light-gage stainless steel.

Atomic-hydrogen welding is accomplished with a twin electrode torch.



One section of atomic-hydrogen welding booths at Ryan San Diego plant

Tungsten wires, set at an angle of approximately 50°, are used as the electrodes for an a-c arc. Surrounding the electrodes are hollow sleeves through which pure hydrogen is forced under low pressure, usually 1 to 5 p.s.i.

Molecular Fission

When the arc is struck between the electrodes, it is bathed in an atmosphere of hydrogen which burns with a yellowish flame. The action of the electric arc changes the hydrogen from its common molecular form, H_2, to atomic hydrogen, H_1. This change causes the hydrogen to absorb a tremendous amount of energy from the arc stream. The energy is released again when the gas strikes the metal and returns to its original molecular condition. The heat thus released by the regenerated gas, plus the heat from the arc, accounts for the exceptionally high temperatures obtained from the process.

The atmosphere of hydrogen prevents the oxidation of either the metal being welded or the electrodes and accounts for the cleanness of the welds and the long life of the electrodes. It also obviates the need of using flux.

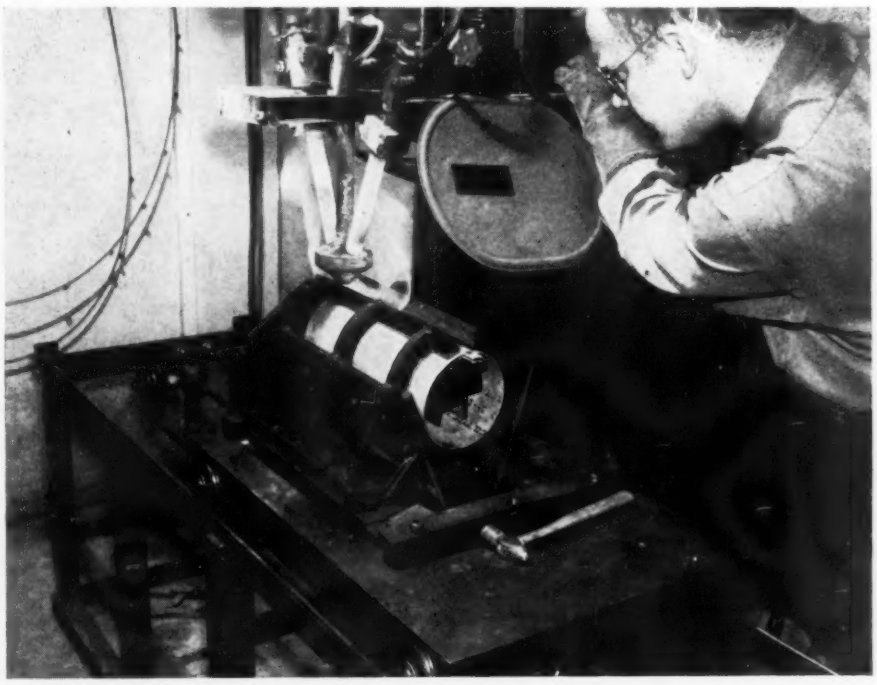
At the outbreak of the war, the major portion of stainless steel exhaust manifold equipment was welded by oxyacetylene. Several disadvantages accrued from the process which affected two of the most important properties of stainless steel, ductility and corrosion resistance. Both were lowered when an excessive amount of acetylene was used. Also the welding time was increased. Carbon picked up from the acetylene reduced ductility and excessive heating caused a partial loss of the stabilizing elements of titanium or columbium. These elements are added to the steel formula to prevent the loss of corrosion resistance when the steel passes through the critical temperature range where its carbon tends to precipitate. Without them, the carbon forms harmful carbides which form a path of intergranular corrosion along the grain boundaries. When either columbium or titanium are added, they combine with the carbon to form harmless carbides which are well dispersed and cannot form a path for corrosion.

The atomic-hydrogen process cannot add carbon to the weld. In fact it usually causes a slight loss in carbon. Since hydrogen is in many respects the opposite of oxygen, a reducing atmosphere is present during the welding, preventing "burning" or severe oxidation. In addition, the higher temperatures of the atomic arc shorten the heating time and thus insure better maintenance of the corrosion resistance of the steel.

It is a fortunate fact that corrosion resistance and ductility of 18-8 type stainless steel are closely related. A weld of good ductility is generally corrosion resistant and vice versa.

Early attempts to use atomic-hydrogen welding met with many stumbling blocks. The high heat of the process made it difficult for the welder to control his speed. Too slow a speed would often result in burning through, with consequent repairs and sometimes complete scrapping of the part. Too fast a speed produced severe shrinking of the weld over its length so that a series of cracks would form. These cracks necessitated repair welding and caused an unfavorable attitude upon the part of the welder and supervisor.

Careful evaluation of experience soon brought forth much interesting and valuable information. It was discovered that the "silent arc," obtained



Automatic atomic-hydrogen welding machine has weld speed of 28 in. per min. Machine was developed at Ryan

when the electrodes are held closely together, permitted a finer control on thin gages of metal. The "singing arc," developed by separating the electrodes to a greater extent, often forced the welder to work so rapidly that cracks would develop.

The formation of worm holes almost in the center of the weld and running lengthwise with the bead puzzled the technician. They were caused by too rapid welding in which the metal was not given time to flow flat before it became frozen.

Although present methods for using the atomic-hydrogen process call for a welding speed that is somewhat slower than the early rates, they are more than twice as fast as oxyacetylene. The use of the "silent arc" has become standard in the industry.

Atomic hydrogen is also used quite successfully at Ryan for tacking. Higher hydrogen pressures and current values are maintained to insure the high heat required to bring the metal temperature up quickly so as to develop a small weld without distorting the assembly. Another advantageous technique is to adjust the tungsten electrodes so that the arc fan can be rotated to almost any desired angle. This flexibility permits a great range of welded joints and allows the welding of ill-fitting parts with a good degree of proficiency.

At Ryan, we have welded lap, fillet, butt, flange, seam and edge and corner joints with atomic hydrogen. The process has proved to be adaptable to a wide range of joints and to produce sound, fatigue-resistant bonds.

For use with low carbon steel, the atomic process has offered an excellent means of joining thin-gage materials on both irregular and closed angle welding.

The welding output has been increased materially because of the greater speed attained and the narrower weld bead has helped to make visual inspection easier. A uniformly narrow weld-bead coupled with adequate penetration indicates a fine degree of control and usually shows that the metal has not been overheated.

Because of the greater amount of welding which can be completed in an eight-hour day, the cost of atomic-hydrogen welding is lower than that of the oxyacetylene method. About one-third of a cylinder of hydrogen per operator is used daily with an electrode cost of about 20c. We estimate that atomic-hydrogen welding runs 5c per ft., oxyacetylene 11c per ft.

Ryan has designed and built its own conveyor systems for use with atomic-hyrogen welding and thus created automatic machines which can produce smooth welds at the rate of 28 in. per min. This compares with 5 in. per min. by oxyacetylene and 10-12 in. per min. by Metallic arc.

Service to the Ryan plant is by parallel 12-kv. feeders, and distribution throughout the atomic-hydrogen welding section is at 440 volts. Individual machines are fed by two No. 8 wires, single phase. Current for the a-c arc, amounting to 27 amp., is furnished through a 440/75-volt transformer.

Electrical service to the atomic-hydrogen welders is a negligible consideration with reference to the entire welding load, inasmuch as 25 spot welders, each rated 75 kva., and 45 metallic arc welders, mostly 150-amp., are also on the lines. The spot welders are electrically arranged in interlocked groups so that only one machine in a group is operating at any given instant.

Plant load as a whole is kept at good power factor (usually about 98%) through a connected load of 375 hp., in synchronous motors, mainly used for air compression and for driving plating generators, and thus operating at high load factor.

Atomic-hydrogen welding has met the rigid requirements of both army and navy. Furthermore, once technique was developed, it was found that it was not a difficult one for new operators to learn. Women proved to be speedy and proficient welders, and during the height of the manpower shortage, women were certified after one week's instruction, then given further training on the production line. Many welding authorities believe that the many peculiar advantages of atomic-hydrogen welding will bring it into increasing prominence in time.

Planned Maintenance of Welding Machines

Preventive inspection policy and programmed lubrication and repair play major role in avoiding down time

C. A. Lehton and H. F. Worcester
Electrical Maintenance Department
Ryan Aeronautical Co.

FOR more than three years the Ryan Aeronautical Co. has operated 75 electrical welding machines in its San Diego plant with virtually no lost machine time. Much of this period the factory was on an urgent three-shift war production basis. There are 45 arc welding machines in this group which have operated continuously without any stoppage interfering with production. Among 25 spot welding machines there was one stoppage, due to a burned out transformer, which occurred in the early part of the period. This necessitated a four-day machine loss because of the difficulty of procuring this part during wartime.

Credit for this enviable operation record is due to the systematic method by which preventive maintenance is handled in the plant. The Electrical Maintenance group is responsible for maintenance of all electrical welding equipment. They carry out this job under the direction of Plant Engineering. They operate on the principle that "an ounce of prevention is worth a pound of repairs."

The system of scheduling and carrying out lubrication, mechanical and electrical work is illustrated in the case of 25 spot welders. A designated group of personnel is assigned under a qualified electrician to maintain these machines.

Most of the spot welding machines at Ryan are used in the production of aircraft manifolds and formed and welded structures of extremely complex

Copper electrodes being dressed with emery cloth to remove oil, oxides, etc.

shapes. As the components of these manifolds, the various subassemblies into which they are welded must be finished by grinding, so that the welding machines are unavoidably subjected to dust. Many of the maintenance problems encountered are caused by this dust, particularly those that have to do with the delicate control and timing devices with which the spot welders are equipped.

For example, despite the fact that these controls are housed in sealed or filtered cabinets, it is necessary that the housings be wiped out with clean rags and cleaned with blasts of air as often as once a week. The heavy load that is imposed on the sequence and timing controls is indicated by the fact that machines on production assignments may be required to make welds at a rate as high as 130 spots a minute. Under the most severe conditions and heavy load, it has been found that the effective life of some vital parts (contacts or bellows) may be as short as one week.

Maintenance of controls consumes the greater part of the time of the men who are primarily concerned with the care of the spot welders. The group of 25 machines is equipped with a wide range of types of controls, from the purely mechanical or pneumatic through various combinations to the completely electronic. It has been found that prompt and complete replacement of any malfunctioning unit is the best way to keep machines in operation. Accordingly, spare units of all types—tubes, relays, contacts, switches, capacitors, transformers, valves, bellows, etc.—are kept on hand. Defective parts, detected by inspection, are removed and routed to the electrical shop for overhaul and functional test before being returned to maintenance stock.

Another important matter is the maintenance of the pneumatic cylinders with which many machines are equipped. The air valves of these devices are checked frequently, twice a week or more often, for leaks and for smooth operation. The lubrication of the cylinders, most frequently required oiling operation, is checked at the same time. The use of neoprene packing on these cylinders, which has often rendered more than two years service, has reduced maintenance greatly as compared to that required with the leather packing formerly used.

The spot welding machines are installed in groups over most of the plant area, drawing current from the general network of plant power feeders. Because they draw relatively large currents, the machines of each area grouping are interlocked in such a way as to eliminate simultaneous operation and peaking of load. Inspection of the efficacy of these interlocks is an important part of the maintenance routine.

Ryan operates 45 arc welding machines. Most of these are of 150-amp. size, and the over-all average current used is probably some 50 to 80 amp. Generally, the maintenance of arc welders is simpler than that of the spot welders. Burned rheostat contacts is the problem most commonly met, and spare rheostats are stocked to minimize shutdowns for this reason. Standard maintenance practice calls for a general inspection of these machines approximately once a month including cleaning (dust) and a check of the condition and functioning of brushes and switches.

About five other welding machines are operated—flash welders and atom-

Dusting interiors of measured capacitor type controllers for spot welders is included in the maintenance schedule. In cases where controllers are adjacent to grinders, cleaning is essential

ac-hydrogen machines—but the maintenance of these is a more individual matter, although all are inspected regularly for appropriate electrical and mechanical defects.

Generally, although this practice could not be followed entirely during the greatest rush of war production, each welding machine is removed to the electrical shop for general overhaul, renewal of wiring, etc., once a year. Good preventive maintenance on the floor kept many machines in operation for more than two years, without general overhaul.

A record of the work scheduled and performed on each machine is kept in two-part loose-leaf form. The first part of this individual machine record is a cardboard strip, 4½x11-in., which lies over the 8½x11-in. sheet that constitutes the second part. On the cardboard strip, space is provided for entering a complete list of the scheduled work for the machine covered, and the frequency with which each operation is to be performed. On the exposed (right) half of the underlying full sheet there are columnar spaces in which the completion of each operation is checked off. There is enough space to provide for completion notations for 13 weeks, and a new sheet is provided at the beginning of each quarter.

These forms are distributed by the plant engineering department to the various supervisors of maintenance departments: electrical, mechanical and carpenter shop. Here, they are given to the inspectors who make the inspection and repairs according to the instructions on the forms. The inspectors return the cards to their supervisors after the work has been done. They are checked and placed in a file.

Whenever an inspection discloses the fact that a major overhaul or repair is necessary, the mechanic writes out a special request which goes to the supervisor, and the work is performed under specific instruction.

Lubrication of all equipment, including electrical welding machines, is scheduled and performed in accordance with instruction printed on card forms furnished by the Standard Oil Co. of California. These cards are printed according to the direction of the Ryan Aeronautical Co. and then completed for each machine to be lubricated. A white card is used for the plant engineering department and a tan card for the electrical maintenance files. The inspector makes his notation on large ruled sheets which allow space for a month's operation. These cards indicate the parts to be lubricated and the lubricant to use.

The employment of systematic methods for maintenance and lubrication coupled with clear written material has sharply reduced breakdown time at the Ryan Aeronautical Co. Maintenance costs have been reduced approximately one-third because repairs and adjustments become evident before they can take on large proportions. Greater utilization of plant machinery and more economical operation of production tools have been the advantageous by-products of this system.

Television—the Status Quo

RCA engineers tell the AIEE that the four big technical problems are licked—the rest is business

At the AIEE meeting in Seattle (see September ELECTRICAL WEST) Pacific Coast engineers had a chance to see what postwar television looks like, and it looks good. Particularly impressive was a demonstration of the sensitivity of pick-up. Illumination in a corridor of the Olympic Hotel was cut down to a sort of twilight. In this illumination the equipment picked up individual faces, transmitted them to an adjacent room, and produced bright, recognizable images.

This demonstration went along with a paper, *Television—A Review of Present Status*, from which the following is abstracted. The paper was presented by E. W. Engstrom and R. D. Kell, both of RCA Laboratories, Princeton, N. J.

Television's faltering start as a commercial enterprise was halted by the war, when all television developments were reoriented toward military objectives. This did not stop progress toward eventual development of television as a public service, however, for significant war developments are now becoming available for general use.

Engstrom and Kell say that "television will soon be back with us and will shortly take its place among the other regular household facilities which we have come to regard as essential in the modern home."

Their paper does not probe the economics of television, either as to cost of sets or cost of programs. One may infer from their statement just quoted that while cost may affect the speed with which television may arrive it will not prevent its arrival.

The authors turn rather to lessons learned in the 18 months or so before the war when television was being commercialized. Four problems became evident at that time, and the paper outlines progress with respect to these four.

Available Channels

The first problem was to enable several transmitters to operate simultaneously in a given area and thus make competitive broadcasting possible. Since a single television transmitter radiates over a wider range of frequencies than the whole region now assigned for standard sound broadcasting, the bands assigned by Federal Communications Commission to provide ten television channels necessarily extended into very high frequencies. At the time of assignment, no transmitter tube would permit operating with useful power on all of the assigned frequencies. Such a tube has since been designed and is now available.

Networking

The second problem was to tie together transmitters in several cities so that the range of vision available to any individual viewer could be increased and the benefits of network programs realized. Because of the very high frequencies involved, television cannot be carried either by ordinary telephone lines or by long-distance radio. Very high frequency radio waves do not follow the earth's curvature; the practical limit of television transmission by radio may be roughly placed at 30 mi.

Two practicable means are available for networking television; radio relay and coaxial cable. American Tel. & Tel. is installing an experimen-

tal radio relay system between New York and Boston. Seven intermediate stations are involved. Bell telephone systems are installing coaxial cable* and it is thought that a coast-to-coast channel may be available by 1950.

Camera Sensitivity

The third problem was to develop the sensitivity of the camera to a point where it would pick up images in all kinds of settings without necessity for special illumination of the subject. A tube which would do this, called the image orthicon, was developed during the war and is in production. This tube is more than 100 times as sensitive as its predecessors, and in some situations more than 1,000 times as sensitive—a spectacular improvement of 2 to 3 orders of magnitude. Its most impressive performance to date was the televising of the New Year's celebration at midnight in Times Square, New York, with no additional illumination. The image orthicon is about 15 in. long by 3 in. in diameter. It incorporates numerous improvements in detail and principle, particularly the design of each part to perform a single function.

Better Pictures

The fourth problem was to improve the size and brightness of the picture. Two developments have contributed toward this end. The first is a method by which an extremely thin layer of aluminum is placed on the back surface of the image end of the viewing tube (kinescope). It is thin enough to allow the electrons to pass through it and excite the phosphor, but it has a mirror-like surface which reflects the light thus generated. This nearly doubles the brightness of the tube and by eliminating scattering within the tube increases the picture contrast.

Large pictures were produced by an optical system similar to that of the astronomical reflecting telescope operating in reverse. This made necessary, however, the use of a correcting lens. Being optically weak and nonspherical of surface, this lens was too expensive for inclusion in a home receiver. Now, a method has been developed by which a negative master can be made in metal and used to turn out inexpensive molded plastic lenses. These provide a very practical means of producing large television pictures in the home.

Technically, television is in a state of production readiness. Economics will determine when.

* Pacific Tel. & Tel. has an 8-tube coaxial cable from Sacramento to Marysville, Calif. Next Western installations will probably be Sacramento to Portland, and Phoenix to Los Angeles. Telephone systems use coaxials for multiple-channel communications, usually think of a coaxial installation in terms of 1,500 or so voice circuits.—Ed.

Addenda to the AIEE

Completing notes on the Pacific Coast meeting—abstracts of two papers presented at Seattle which pertain to utility engineering

FOLLOWING are two abstracts not included in last month's report of the AIEE meeting in Seattle, completing the program of papers bearing directly on power systems engineering.

Fault-Current Measuring Device, Martin J. Lantz, Bonneville Power Administration, Portland, Ore.

Reports on the development and application of a magnetic link fault-current measuring device which has a maximum deviation from oscillographic records of 12% and an average deviation of only plus or minus 5%. It consists of one or more copper coils surrounding magnetic links, and a high-speed voltage relay with normally closed contacts shunting the coils. It is used in connection with a surge-crest ammeter and demagnetizing coil. The by-pass relay is activated by system protective relays so as to place the device in operation one cycle or more prior to the zero point of the interrupted wave. After operation, the by-pass relay locks out to prevent a second operation. The device has the advantage of economy, yet improves on the accuracy of the annunciator ammeter for use as a fault locator using the current-ratio method.

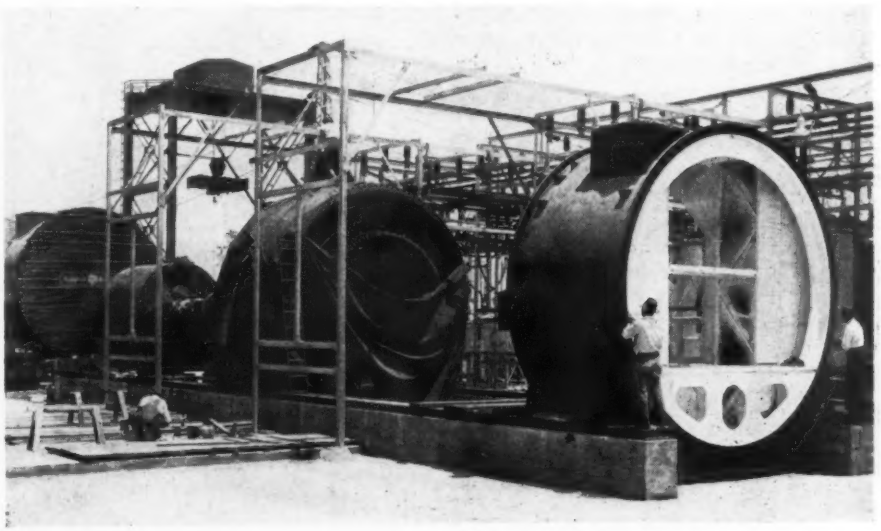
Field Tests of Power Line Carrier Current Equipment, R. H. Miller, Pacific Gas and Electric Co., and E. S. Prud'homme, General Electric Co.

Tests covering both amplitude and frequency modulated equipment were carried out on PG and E's war-expanded power system, as it was realized that maximum performance was not being obtained from the carrier system. Data were taken to determine such things as carrier and audio frequency response of the equipment, and a comparison of FM and AM signal-to-noise ratio.

The authors stated that the tests resulted in obtaining maximum performance and showed that the frequency-modulated system provides a definite advantage over the amplitude-modulated equipment insofar as signal-to-noise ratio is concerned, even with large variations of carrier signal.

Edison Gets Double-Purpose Machine

Two synchronous condensers for Southern California Edison, to be used initially as a frequency changer set are going into place at High Grove substation. On the foundations are rotor, stator frame, and inner end bell. Outer end bell is still crated. Rating of the 60-cycle unit is 12 pole, 60,000 kva, 600 r.p.m., 13,800 volts; rating of the driven end is 10 pole, 50,000/60,000 kva., 600/700 r.p.m., 11,500/13,800 volts, 50/60 cycles. Both will have direct-connected exciters operating in hydrogen. G-E is also furnishing a second, similar machine.



Applying the Code to Homes

Look at these sketches and you'll find where new rules apply in wiring a typical vet's house—third of a series on the 1946 code

James Moore Evans

HERE, in graphic form, is an attempt to show at a glance how the 1946 National Electrical Code will apply to one of today's most common wiring problems — the veteran's house. This visual reference comes as a sequel to the cross index between the 1940 and 1946 codes, and the summary of significant code changes, published in ELECTRICAL WEST for August and September, respectively.

The drawings herewith endeavor to list the appropriate paragraphs in the new code at the points where they apply in the wiring of a house. Furthermore, by means of extra-black figures, attention is drawn to those new code paragraphs which change the former practice.

This article does not attempt to evaluate the wisdom of the changed practices prescribed by the new code. To one who has been a student of the code for more than 35 years, and at times active in code formation, the new code appears as a studied piece of work, undertaken by high-caliber men. It is difficult to realize how good it actually is until one endeavors to rewrite a paragraph so as to improve it.

The veteran's house is chosen as the means of illustrating the new code for two reasons. In the first place, construction activity is now concentrated on veterans' housing to an extent which makes such an example one of wide, practical usefulness. In the second place, the veteran's house is an excellent illustration of some basic concepts which lie behind the formation of a code.

One such concept is that electricity for a residence is a convenience. That is to say, electricity cannot actually be *proved* to be a necessity. For light, tallow candles could be used, or oil lamps could be carried from room to room. Wood stoves could be used for cooking. And so on.

In other words, it is convenience, not necessity, for which people pay when they order an electrical installation. Convenience seems an especially logical objective in the construction of houses for men who are seeking the comforts of home after years of privation on the battle front.

Convenience is of special importance in the electrical installation because so much extra convenience can be added for so little extra cost.

It is well to bear this in mind wherever the code is applied, and particularly where the code is applied to veterans' housing, because the code's purpose is to see that whatever installation is made is such as to provide a reasonable degree of safety to life and property. The code, being written for safety's sake, does not, therefore guarantee convenience.

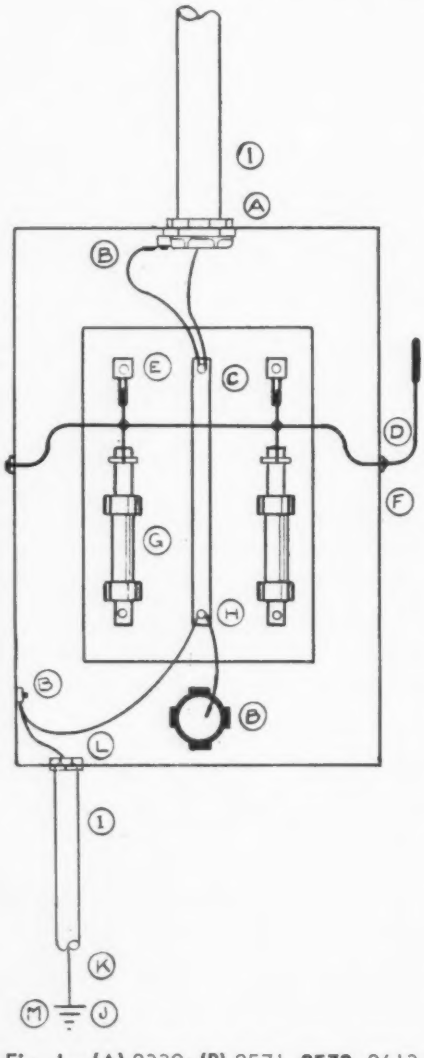


Fig. 1—(A) 2339; (B) 2571, **2572**, 2613, 2561, 2382; (C) 2351, 2353; (D) 2354 to 2357; (E) **2358**; (F) 2381, 2436; (G) 2371, 2375, **2403**, 2434, **2440, 2452**; (H) 2523, 2525; (I) 2531, 2532; (J) 2581, 2614, 2615; (K) 2591, **2592**, 2594; (L) **2572**; (M) 2616, 2617

In general, the code is designed to protect property from hazards incident to the use of electricity, particularly in places where the installer might not foresee the hazards.

Any product mentioned in the code is safe to use if the restrictions as to its use are followed. These are minimum restrictions, however, and if common sense, especially when fortified by another part of the code, dictates a greater factor of safety, there is every reason to take the safer precaution.

An example of this principle may be found in Fig. 2, where we find an outline of a residence together with the exterior wiring. The numbers refer to paragraphs in the code of particular interest at the point where the number is shown. Dimension lines are drawn between the overhead service drops and the street. On one of these we find 2322 b. The small paragraph corresponding to this number states that the drops "shall have a clearance of not less than 10 ft. from the ground or from any platform or projection from which they might be reached."

This is good as far as it goes, but it is not very realistic. Just imagine a moving van or a load of hay trying to pass under the wires! Common sense says that 18 ft. is better. So 2324, "Point of Attachment to Building," gives the added factor of safety dictated by common sense.

The moral is that an installation should not be "cheaper" than the National Electrical Code authorizes.

There may be some reason for a restriction that is not evident. To ignore it might make a "cheaper" installation. It may also make an installation which becomes suddenly, dangerously hazardous. It has happened.

In general, the restrictions are severe enough, and if more money can be saved on one method approved by the code than on another method also approved by the code, it is all right to use the less expensive one, provided common sense shows the two to be equally safe. Save the money.

It is not necessary or advisable to

"gold plate" a job for a veteran. On the other hand, it's a safe bet he wants his home to look classy—service cable drops rather than three open wires, multibreaker load center, plenty of outlets, etc. He wants convenience.

The most necessary regulations are shown in the Figs. 1-3. The black face numbers indicate regulations that were not in the old code.

This article and its two forerunners, mounted on the shop bulletin board, will provide foremen and journeymen with an easy-to-read reference. If such a reference prevents even one mistake which might have otherwise been made, it will have saved many, many dollars.

Fig. 2 (right)—Here's the service entrance to a vet type house. Black numbers refer to new code paragraphs which have changed the wiring rules. Light numbers refer to new code paragraphs which lay down rules similar to those in effect before. Also see blow-up those in effect before. Also see Fig. 1

Fig 3 (below)—Here's the inside of the house, with notes like those in Fig. 2

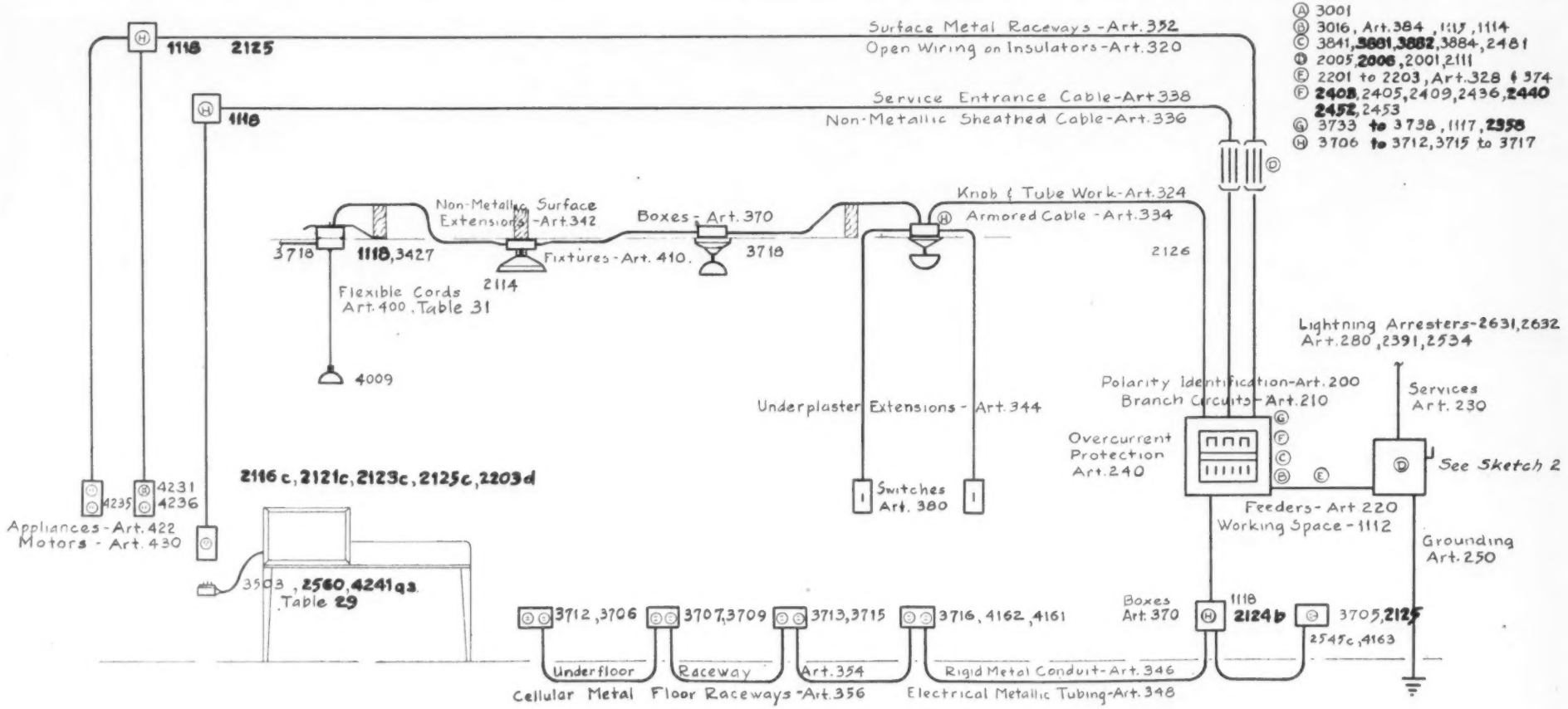

Ⓐ 3001
Ⓑ Ⓒ 3016, Art. 384, 1117, 1114
Ⓒ 3841, 3881, 3882, 3884, 2481
Ⓓ 2005, 2006, 2001, 2111
Ⓔ 2201 to 2203, Art. 328 & 374
Ⓕ 2408, 2405, 2409, 2436, 2440
2452, 2453
Ⓖ 3733 to 3738, 1117, 2958
Ⓗ 3706 to 3712, 3715 to 3717
Surface Metal Raceways - Art. 352
Open Wiring on Insulators - Art. 320
Service Entrance Cable - Art 338
Non-Metallic Sheathed Cable - Art. 336
Knob & Tube Work - Art. 324
Armored Cable - Art. 334
Non-Metallic Surface Extensions - Art. 342
Boxes - Art. 370
Fixtures - Art. 410.
Flexible Cords Art. 400, Table 31
Underplaster Extensions - Art. 344
Switches Art. 380
Lightning Arresters - 2631, 2632
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Table 29
Boxes Art. 370
Underfloor Raceway Art. 354
Cellular Metal Floor Raceways - Art. 356
Rigid Metal Conduit - Art. 346
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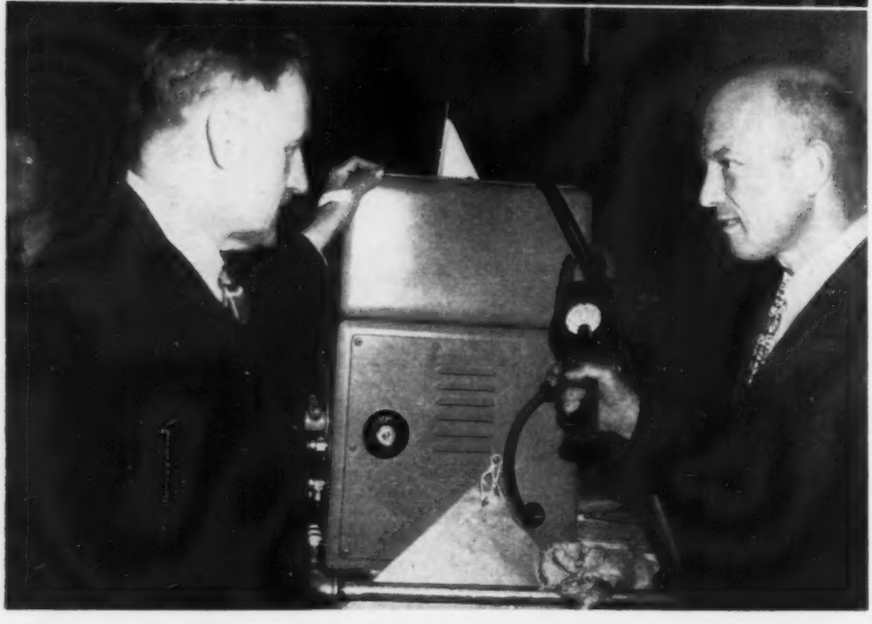


Hi-Frequency

INTENSE interest in the possible applications of high-frequency heating to Western manufacturing processes was evidenced from at least 800 different individuals who attended the high-frequency heating conference staged by 15 cooperating societies at the Pacific Gas and Electric Co. auditorium Sept. 5 and 6. As explained by General Chairman J. H. Gumz, PG and E, in opening the meeting, the 15 organizations were cooperating to present the conference to spread knowledge of both induction and dielectric heating so that it might be helpful in the industrial development of the region. The industrial section of the San Francisco Chamber of Commerce likewise was interested, in order to retain in the bay region the electronics manufacturing industry developed highly during the war.

The conference was well designed to present, first, the basic fundamentals of high-frequency heating, to differentiate between the dielectric and the induction processes, and then to review the practical applications developed thus far in various types of industry. Likewise, because eight firms displayed twelve units of high-frequency heating equipment, all connected up for live demonstration, at the conclusion of each session, there was a well rounded combination of both theory and practical application.

The Friday morning session having to do with the use of high frequency in food sterilization, brought out the largest attendance. This was in spite of the fact that many canners had felt they might be unable to send anyone because it happened at the peak of the canning season.

This session was confined largely to a discussion of research which is in progress in numerous laboratories At the present time, however, it was disclosed there are very few practical installations of this equipment in the food processing field.

However, in industrial and particularly metal applications, high-frequency processes promise considerable savings in both time and in improvement of products.

Attendance at the various sessions

Top: Typical crowd watching Eitel-McCullough production machine sealing metal to glass for electronic tubes. Center: Lepel machine in hardening operations. Below: Joe Gumz, general chairman and Donald Doub, PG and E, test load demand of Tocco machine

Heating Meet

varied depending upon the subjects covered. The opening session had 300, and the Friday morning food session 340. Both the Thursday afternoon and Thursday evening meetings were well attended with about 250, while the Friday afternoon was the poorest attended with 125. The latter was almost entirely a different group from that which had attended other sessions.

The firms exhibiting and demonstrating high-frequency heating equipment were: Eitel-McCullough Co., which demonstrated an actual production process machine used in the making of electronic tubes in its own factory; Electronic Chemical Co.; General Electric Co.; Ohio Crankshaft Co.; Precision Mfg. Co.; Victor Equipment Co.; and Westinghouse Electric Corp. Scientific Electric Co.'s equipment did not arrive in time to be set up.

In order to supply the current and water demands for the twelve units which were installed, the building wiring of PG and E was surveyed and found to be insufficient. Thus, special circuits were run from a transformer vault in the street to provide 214 kva. of capacity for an estimated 116-kva. input, 60 kva. of which was 440-volt, three-phase, 10 kva. 220-volt, three-phase and 46 kva. 220-volt, single-phase. Twenty-five gallons of water per minute were also required for cooling of various machines. This phase of the arrangements was made by J. H. Gumz and Donald Doub of Pacific Gas and Electric Co., in cooperation with W. Paul and P. E. Chapman of the engineering department.

The first morning session was devoted to the theory of high-frequency heating. Harvey Searight, Allis-Chalmers Mfg. Co., was chairman of this session. J. H. Gumz gave a brief welcome and told the purpose of the conference and then R. A. Neilson, Westinghouse Electric Corp., Los Angeles, gave a very vivid and thorough explanation of how dielectric heating works and the apparatus required for it.

Dr. Paul Morton, University of California, Berkeley, did the same for

Top: Douglas Burke demonstrates heat treating with 15-kw. electronic induction heater for General Electric. Center: Dr. R. A. Nielson, Westinghouse, at right, shows rapid setting of glue by dielectric heating. Below: K. A. Smith cooks hot dogs by Electronfire

induction heating. A moving picture by Allis-Chalmers, *Metal Magic,* demonstrated use of its equipment.

The afternoon session, over which A. W. Copley of Westinghouse presided, was devoted to metals. J. F. Aicher, E. A. Wilcox Co., gave a paper prepared by Frank T. Chestnut of Ajax Electrothermic Corp. on induction heating, its history and development. Harlan A. Messner, Ohio Crankshaft Co., gave an excellent and practical talk on the application of high frequency to the forging of metals, based on the experience which his company has had in developing its Tocco machines for the automotive industry. R. W. Weld, Pacific Scientific Co., then discussed the baking of foundry cores by dielectric heating, pointing out the remarkable savings in time, the improvements in quality, the savings in space and the improved operating conditions and flexibility of the dielectric method as compared to oven baking of cores. Another point made was that cores could not be burned by the dielectric process.

That evening A. D. Bragg, General Electric Co., presided and Roger W. Dexter, Dexter Metal Treating Co. of Oakland, told of his own company's experience with heat treating using induction heating. John Ross, Handy & Harman, Los Angeles, told of applications of high-frequency heating to silver brazing and soldering, pointing out the considerations that should be taken into account and the advantages of the process, its simplicity of operation, low cost, high speed and accurate control of the heat.

The Friday morning session was devoted to possibilities in the food industries. R. H. Lueck, American Can Co., was chairman. T. M. Shaw, Western Regional Research Laboratory, Albany, summarized the experiments conducted on the use of radio frequency heating for the blanching of fruits and vegetables, the dehydration of vegetables, the thawing of frozen fruits and the killing of bacteria. He discussed the problems involved in applying the radio frequency method of heating to non-uniform and irregularly shaped material. No conclusions could be drawn at the present time because there had not been sufficient time to complete experiments.

Dr. Rhett G. Harris and Dr. James W. Bartholomew, University of Southern California, Los Angeles, had somewhat the same to say about electronic sterilization of fruits and vegetables for canning processes, offering no immediate cure-all or as yet a reasonable substitute for the present heat processing of fruits and vegetables in canning.

Dr. John J. Jackson of American Can Co., Maywood, Ill., reviewed the things which were being sought in research for possible sterilization of foods in the canning industry. Kenneth A. Smith, Electronic Chemical Engineering Co., talked of some particular applications of high frequency for sterilization, pasteurization and enzyme control but his comments were very general in character.

The final session was under Chairman A. M. Ryals, Stone-Ryals Electric & Mfg. Co., San Francisco. Charles Calvert, Precision Mfg. Co., San Francisco, told of the numerous applications of dielectric heating to plastics in various manufacturing processes. Remi Bollaert, Westinghouse Electric Corp., reviewed the processes already developed for application of dielectric heating for furniture, plywood and veneer. Bert W. Depew, industrial heating specialist, General Electric Co., illustrated with slides a number of applications of high-frequency apparatus in various types of industry.

Copies of many of the papers are available from Donald Doub of P G and E, San Francisco.

Talking Beam

Successful modulation of infrared waves at voice frequencies and the development of practicable equipment for communicating by infrared beams has been disclosed by Westinghouse Lamp Division. Infrared voice communication is made possible by a lamp designed at the request of the Navy. It provided a means of communicating between ships at sea, or from ship to shore, without loss of contact through jamming and with little chance of compromise through evesdropping.

Caesium vapor lamp is the transmitter of infrared voice-modulated signal

Adequate modulability was achieved by means of a caesium-vapor lamp. It operates efficiently throughout the 200 to 3,000-cycle voice range, and at some points reached 100% efficiency. The accepted Navy design is rated 100 watts, is 13 in. long, 1¼ in. in diameter, and has a beam spread of 25 deg. Double-bulb construction is utilized to provide a vacuum heat barrier. Life was found to be about one hundred hours.

For naval security, a filter was incorporated to screen out visible light. Pick up of the signals is by photocell mounted in a parabolic collector. By V-J Day, 3,500 lamps had been produced, but auxiliary equipment was not obtained in time for use during the war. Several operational tests, however, had shown the equipment to be very satisfactory.

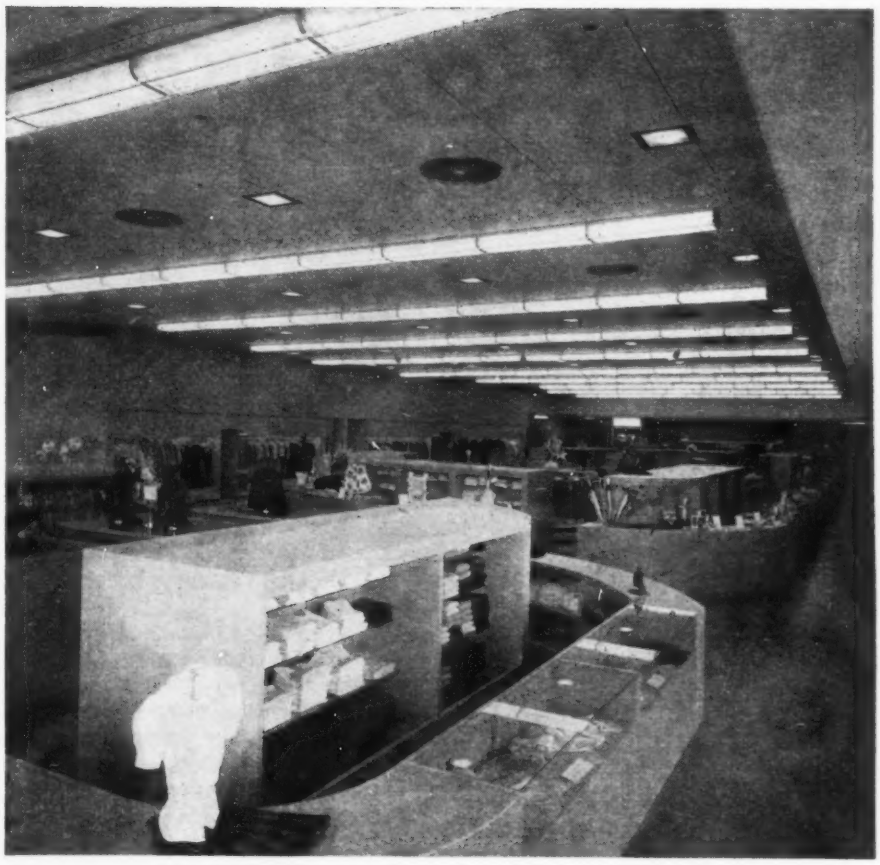
● APPLICATION of ultraviolet and infrared in agriculture will be explored by the University of Idaho college of agriculture under a $1,700 research fellowship from Idaho Power Co. Hobart Berseford, head of the department of agricultural engineering, said the study will include use of germicidal lamps and other units in agricultural production, processing and storage. Previous studies made by the university have investigated the effect of sunlamps on poultry and dairy calves, on the curing and aging of beef and on the control of mold growth on butter during processing and storage.

● GENERAL ELECTRIC has forged a link in the chain of stuff written about adequate wiring. In a very attractive 20-page book, *Electrical Modernization Guide*, the benefits of better wiring and the simplest means of getting it into the already-built home are cleverly set forth. The book advises an "add-a-circuit program" as the way to modernize house wiring with the least fuss and at lowest cost. Free single copies and information regarding quantity purchase may be obtained from G-E at 1285 Boston Ave., Bridgeport 2, Conn.

● TIGHTENING of regulations covering electrical installations and a plan of licensing electricians is being urged in Victoria, B. C., by the International Brotherhood of Electrical Workers. The Brotherhood has suggested: (1) a board of examiners which would pass on the qualifications of electricians prior to licensing and (2) the prohibiting of electrical work by anyone not possessing a certificate of efficiency from the board. This effort by the union is in line with efforts of, for example, the Vancouver Electrical Assn.

Seattle's Bellevue Shopping Square

DRY GOODS STORE. Frederick & Nelson, Bellevue store. across Lake Washington from Seattle, a new shopping square designed entirely by Bliss Moore Jr., architect, for Kemper Freeman, manager of the Square. Bert Heinz, illuminating engineer, assisted in lighting design. Industrial Electric Co., contractor. Fixtures: Pittsburgh and Tube-Art Displays, Inc.



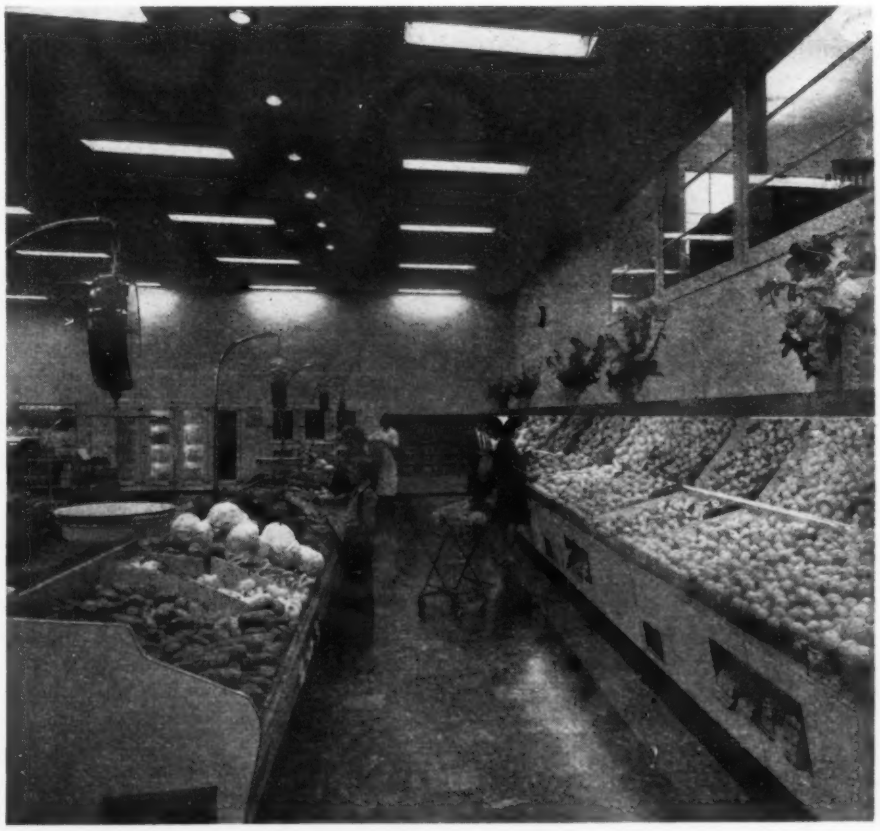
Problem

To light 50x150-ft. merchandising area to make entire store a huge show window as seen from modern exterior.

Solution

In ten rows, 618 ft. of 15-mm fluorescent tubing, 30 ma., 15 ft. between rows, mounted flush on a 14-ft. ceiling, a total of 3,000 watts. Between rows, on 10-ft. centers, 300-watt incandescent lamps in mirrored reflectors behind flush-mounted lens plates. Reflector spots also mounted for high lighting certain merchandise displays. Continuous double rows of fluorescent lamps in cove above show windows along one side and end, 310 ft. total length. Windows lighted by 150-watt reflector spots on 20-in. centers back of glass.

FOOD SHOP, The Food Center, at Bellevue Square. Same architect and contractor. Lighting layout by Bert Heinz.



Problem

To light all parts of a food store, 78x120 ft., and 14 ft. ceiling, with accent illumination on certain areas.

Solution

Installed 86 Daybrite, 3-lamp, 40-watt fluorescent, RLM, closed-end fixtures, flush in ceiling, in six rows of an average of 12 units in each row. Additional punch lighting from a row of 150-watt reflector spots, in swivel sockets flush-mounted in the ceiling over the vegetable and the meat counters. Silvray indirect fixtures with 500-watt silver bowl lamps used in offices.

Results

In Frederick & Nelson, an average of 55 ft.-candles with 75 ft.-candles over counters where spotlights accent the lighting. Similar readings in Food Center.

Why Are Appliance Sales Reports?

Both dealer and utility benefit from watching accurate sales figures, Washington Water Power shows dealers as it offers a new record plan

WHY should a dealer keep a record of appliance sales and furnish such figures to the utility?

Possibly many a busy dealer has asked himself this question as he contemplated the bother of making out records. Seldom has anyone thought it through completely.

But in developing its dealer cooperative program, after making a complete and personal survey of every dealer in the territory it serves, the Washington Water Power Co. found the answer. It also developed a simple yet complete recording system to make it easier for the dealer to keep the score and the utility to add up the totals. Now it is going back to each dealer with that system and helping him put it in operation.

Records of sales, it was discovered, were like the instrument panel on an airplane, the speedometer on a car, the meters on a switchboard. They tell when a line is "hot" or "cold," when a specific appliance needs more "pressure," where that extra "steam" should be applied. Once a dealer appreciates this, the slight amount of bother it is to keep the records more than pays off in better control.

Upon the presentation of this simple recording system to a dealer in appliances, the dealer relations representative of Washington Water Power Co. gives him a single sheet of paper that summarizes the advantages to him, and to the company. There is no doubt in anybody's mind why the company wants the information and what it will do with it. It is a mutually advantageous proposition. Here is what the paper says:

Advantages of Dealer's Keeping Record of Electrical Equipment Sales

1. Provides an accurate record of sales, from which the dealer can determine:

A. Monthly volume of equipment sales.

B. Fast or slow moving items.

C. Which items need special sales emphasis; i.e., special advertising, sales display prominence or special sales assignment to floor or outside sales personnel.

D. Help to determine proper inventory investment.

E. Help to determine whether more advertising is necessary or additional outside salesmen should be hired to secure volume sales compared to other dealer sales in a specific trading area.

F. Provides a record of major equipment sales from which service calls may be expedited.

G. Provides a record from which guarantee period expiration may be accurately determined.

H. Provides a means of determining what a sales department's costs should be, based on an accurate record of dollar sales volume.

With the store record, transferred to the store record card, the specific promotion material can be sent to those who can use it. The dealer range sale card is used by the home economist in following up a sale to assure customer knows how to operate. The master dealer sales report is made up by the utility representative from the dealer report book. Dealers only keep the record, the utility takes the responsibility of gathering up the reports

Advantages to Company and Dealers for Measuring Results

1. Provides an accurate record of equipment sales from which the following can be determined:

A. Town, trading area and division sales of equipment.

B. A record from which dollar volume and individual item volume can be determined so that these volumes can be furnished dealers for comparison with town, trading area, division and system.

C. Market saturations can be accurately measured.

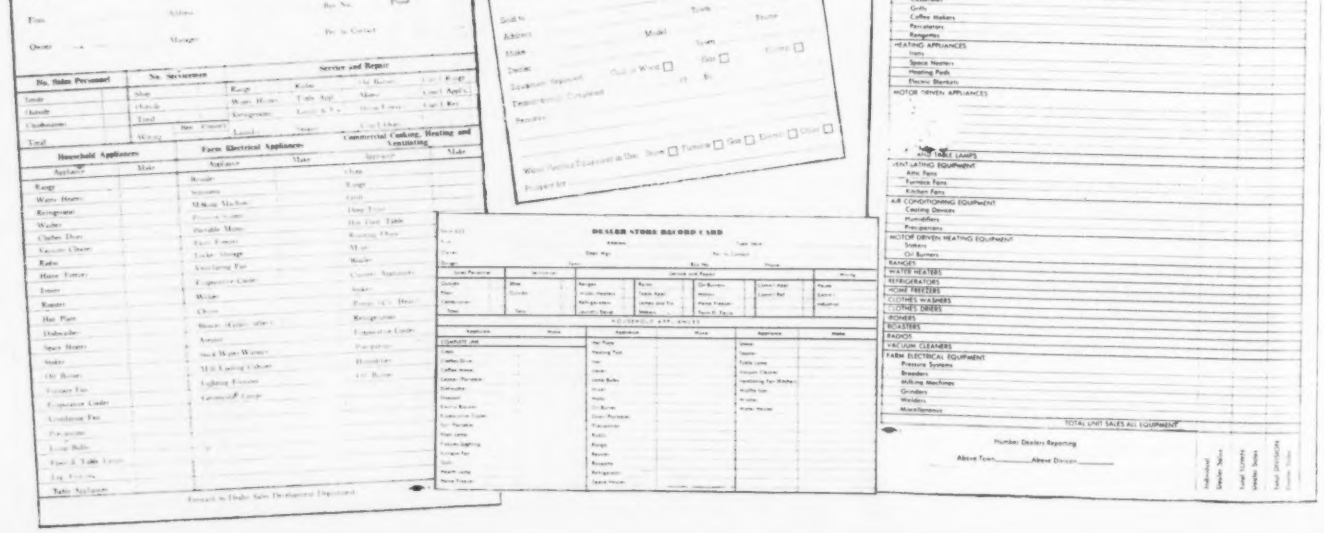
D. Market potentials projected.

E. Market analysis made.

F. Where sales and advertising emphasis should be placed.

G. Estimated annual revenue determined.

H. Dollar and item sales volume determined for comparison with former



L. E. Elliott, Elliott's Paint Store, one of Colfax, Wash.'s pioneer appliance dealers, receives the dealer record book from Vic Casebolt of Washington Water Power. Note how the cost of operation charts and yardstick are mounted above the appliance display

years for analysis in market stimulation.

Thus thought out and talked over, every dealer sees these advantages and there has been unanimous acceptance.

A word about the survey which led up to this plan of operation. More than two years ago, Ross McElroy, then general sales manager, set about to find the real lowdown about how dealers felt and thought as to the power company's entire merchandising program. The domestic sales staff, immobilized by war stoppage of appliance manufacture, became a survey staff. A careful and thorough and long survey questionnaire was made up. To assure accurate reports and complete coverage, each was made in a personal interview with each dealer.

Then the results were studied. The views of dealers were by no means unanimous, even on such questions as to whether the company should go out of direct selling. The views were all analyzed from many angles. It was not a matter of taking votes on this or that question but of trying to determine from all the answers the policies that would prove best for all.

McElroy came to the conclusion, "If it is going to be of value to the dealer, then it is all right for us. If it isn't good for the dealer, it is no good for us either." And he decided to devote himself exclusively to this dealer coordination program as one of the most important things he could do for the company.

Although the company decided not to do any direct merchandising at the present time, in announcing this to the dealers it made it clear that this did not mean it may not find it necessary to do direct selling on some items from time to time. What is more important, out of the survey came a great fund of opinion and ideas that will assist the company to place its strongest efforts where they will do the most good to help sales go through the dealers.

And one of the prime needs that the survey disclosed was the need to know just exactly what was doing, what was being sold, what needed help, where some extra assistance might be needed. A record system was necessary. How then best to make it so that every dealer would use it, keep it active, like it, get some real benefit from it?

Frank Tool, assistant to McElroy and his staff, developed the record system. It consists of an attractive loose leaf cover, containing tabs for each month of the year. Then for each month there is a sheet for table cookery, heating and motor driven appliances, portable lamps, ventilating equipment and farm equipment. There is a sheet for electric ranges and water heaters; another for refrigerators and home freezers; another for washers, dryers, ironers and roasters; another for radios and vacuum cleaners.

The small appliance sheet merely has small squares for each day of each week, by weeks for the month, in which to jot down the number sold that day of the appliances listed in the outside column. Then there is a total column at the opposite side. It is shown to the dealer that this gives him a daily picture of how each appliance sells and indicates to him whether he should shift the display of it, advertise it more, or eliminate the line or brand. He knows immediately the effect of any special promotion. He can instruct his sales people if he sees they need it.

The other sheets are divided to keep a record of the date sold, to whom it was sold, the town, address, catalog number and model, ticket number, sale price and whether cash sale or on contract. Much of this information is not wanted by the company at all but is useful to the dealer. He can tell, for instance, what proportion of his sales are contract, what cash.

The power company's dealer coordination man comes each month and takes his own report from the dealer book. The dealer then does not have the chore of making out a summary for the company. On the other hand the dealer representative, being a trained merchandiser, often can make helpful suggestions to the dealer regarding the improvement of sales of some slow moving lines, or he can suggest timely promotion stunts to take advantage of seasonal or other trends.

A recap sheet for each division is made up by the dealer coordinator for the company and sent to headquarters in Spokane. This is entered on a master sales summary sheet. Thus the dealer's own figures as an individual are confidential and only totals reach the main office. The figures will then be published and distributed to all dealers in a company dealer publication. Figures for appliance sales will be broken down by appliance for each town, trading area and division and for the system. Against the town's total the dealer can see how his own sales compared.

For dealers that do not handle all appliances, only those sheets that apply are furnished in the record book. For instance, plumbers usually have only the water heater sheet, fuel dealers the stoker sheet.

Names and addresses are taken off the dealer record by the company man for each range and water heater sale. This information is put on a card and given the home service advisor, who calls on the customer, offers assistance if needed in learning to use the range, checks the fuel replaced, and notes whether the customer is a prospect for any other appliance. This news is then relayed back to the dealer who made that sale.

Another record card file is kept by the power company of each dealer store, regardless of size. This lists the appliances carried and other pertinent information. The dealer coordinator reports any changes in ownership or lines or status to the master file in Spokane. This card file is used to direct literature and promotion materials to specific interested dealers.

In each store in some prominent place, the company's simple rule for figuring the cost of operating appliances is permanently mounted. The dealer sales staff is shown how to tell any customer how much it will cost

him or her to operate the appliance. The customer tells how much his present bill is. The salesperson points to this on the ruler and shows how much more the appliance will add to the bill. The ruler is stepped down and marked off in dollars and cents as well as kilowatt-hours. Tool is also working on a simple slide rule which will fit the pocket so a dealer salesman can take it with him to answer customers as to operating costs.

FM Broadcasts

Regular daily commercial FM broadcasts will be started in the San Francisco Bay Area with the opening at Richmond of Station KRCC, owned by the *Independent*. Walter M. Boland, Western district manager, General Electric electronics department, reported on his return from a visit to Schenectady headquarters, that the company had supplied the first Bay Area commercial FM transmitter to the Richmond *Independent's* Contra Costa Broadcasting Co., and that the station would be operating by November. A second station, KWBR in Oakland, is expected to be on the air after Jan. 1.

At a press conference, Boland said that home radio set production is 1,250,000 units monthly—20% above the 1941 figure; that FM receiver production was to start in volume in October, by March would equal 30% of all units manufactured and 85% of all units priced above $75. Of 230 final FM construction permits granted nationally, 31 are in the Western States and 13 in California; of 261 conditional FM construction permits, 29 are in the Western States, 21 in California, 10 in the Bay Area, he said.

The conference previewed the G-E postwar line of Musaphonic FM-AM receivers and heard a special program broadcast from KALW, an FM station owned and operated by the San Francisco Board of Education.

With regard to television, Boland reported that receiver production would start in November and estimated that there would be 100,000 units in 1947 for five markets, Los Angeles, Philadelphia, New York, Chicago and Schenectady. There are now 127 applications for new television transmitters and it was expected they would be operating late in 1947. Color in television is in the laboratory stage now, he said, and probably will not be available commercially for five or ten years. Color receivers now cost twelve times more than black and white receivers.

In commercial radar, a navigator has been tried out at Seattle and deliveries are scheduled for November; the aircraft obstacle detector has been tested in the East and West and deliveries are expected late in 1947.

Junior Homemakers

Programs stimulate youthful interest

ALL kinds of cooking schools and cooking classes have been conducted for adults. The schools and colleges give domestic science training in schools but Puget Sound Power & Light was the first company to conduct a junior homemakers school for teen age girls of from 10 to 14 years and the experiment was a great success. Miss Edith Rauch, director of home service, started this junior homemakers school in the company's Northeastern division at Everett, Wash., on Aug. 22. There were approximately 150 "future housewives" given certificates by the company at the end of the six-lesson course in junior cookery and home management.

The curriculum included cooking, baking, marketing, use of equipment, home lighting, and etiquette. The course ran for three weeks with two classes each on Tuesdays and Thursdays. During the school two well-known home economists were guest demonstrators. They were Celia Lee, Centennial Flouring Co., and Jane Bronson, Washington State Dairy Council.

On the final day the girls watched a series of color moving pictures, including Westinghouse's *The Dawn of Better Living* and a preview showing of the Reddy Kilowatt film *Reddy Made Magic*. After the movies the happy grads were given their certificates of completion. Reddy Kilowatt bracelet charms and fancy Reddy Kilowatt aprons. This presentation drew plenty of oh's and ah's from the assemblage and was followed by a party involving generous quantities of ice cream and cookies.

Miss Rauch feels that this experimental class discovered to her the great need for this type of educational work among young girls and their eagerness to receive it. Expecting only a few enrollees in response to advertising announcing the class in the Everett daily papers, she was surprised to find 150 girls signed up. Moreover, they displayed great eagerness for all the information given out and appreciation for the opportunity. Miss Rauch feels that this program should be expanded to other divisions of the company and plans undoubtedly will be made to do so next vacation season.

Another program to stimulate youthful interest in the company and demonstrate, in turn, the utility's interest in community affairs was carried on in Bremerton. It was the formation of a junior athletic council which brought about the organization of a "Pee-Wee" baseball league for boys of 10 to 14 years. The American Legion actively sponsored another circuit for older boys.

The power company issued a folder suggesting certain methods of preserving athletic equipment. It was titled *Reddy Tips to Kid Big Leaguers* and was distributed over the counters at the Bremerton Puget Sound Power & Light Co. offices. In addition, the booklet provided that if the youngsters qualified under certain rules they would be rewarded with a Reddy Kilowatt pin. A boy was required to get a signature by his parents, which meant that the parents, too, would read the folder.

Puget Power also equipped eight teams in the Pee-Wee league with baseball caps with the Reddy Kilowatt emblem.

Junior misses of Snohomish County, Wash., learning the arts of home making from Vivian Widmer, home economist of Puget Sound Power & Light, at a three-week course held at the Everett office. More than 150 girls "graduated"

ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © OCTOBER, 1946

Radio is here to Sell—NOW!

THAT long-awaited time has come, as far as table models of radios are concerned. There **is** a supply. Maybe not all that you can sell, nor of the brands you would like, but there are supplies of them.

Turnover is what makes profit. You want plenty of it at today's margins.

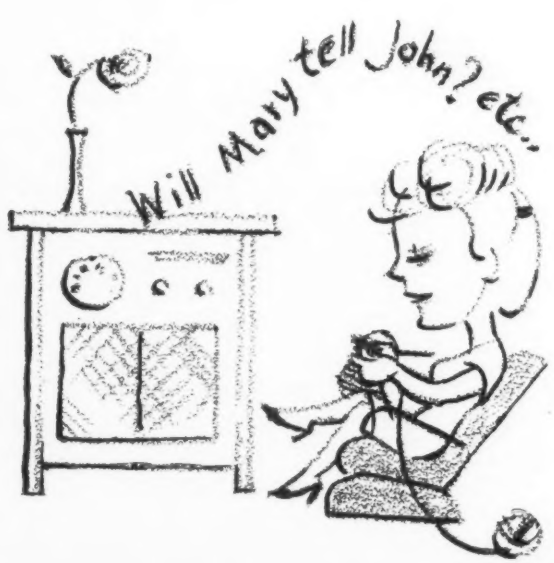
Don't you suppose perhaps people still have the idea that all you have are **samples** that they cannot buy and take home? They have been held off so long they think new models are just for **seeing** purposes, not **listening.** Maybe they are still waiting for that fantastic **postwar model,** not realizing that the ones you have to sell are just that kind, with new circuits, wartime know-how, and improved features.

With fall radio programs back on the air, with football and other sports to compete with concerts and dramas, with the families fighting as to which program to listen to, now's your chance to push the table models, the individual radio, the portables.

With Christmas coming here's something you can feature as the prized gift.

National advertising is hitting hard at this market. Stocks are improving and more are on the way. It really is time to make radio pay.

In promoting and selling, of course each make has its own features of design and construction. No need to be reminded of them. Yet to back them up, it is well to remember and stress the basic reasons why a person will buy and to use them in



telling of these features. They can be worked into your sales talk or advertising smoothly. Don't take them for granted. They may be just the urge to convert a **maybe** into a **must have.**

Here they are:

1. **Individual choice** of what each wants to hear. If children want their own programs, grownups can have theirs too. The individual extra set in another room gives each his choice. If the man or boy wants sports and the women want music or drama, each can have what he prefers
2. **Portable,** or at least easily moved, and not occupying much space, the table model fits today's crowded housing conditions, yet gives everyone the chance to enjoy radio.
3. **Attractive**—Newest designs and new plastics and veneers give the 1946 models the really **new** touch every home needs.
4. **More convenient**—Prewar models usually required antenna, could not be moved without some bother. New models need nothing more than plugging in.

So just don't advertise table models, tell your customers what **individual satisfaction, convenience** and **pleasure** they can get out of **today's** up-to-date table models. It may remind them that they **really do need** one, after all. Without telling them, it may not have occurred to them that there was a solution to their annoyance over a contest as to whose program was to be heard on the family set.

Selling is the **art of putting your product into terms of satisfying some need or desire your customer has,** whether he or she is aware of it or not. During the war scarcity years you didn't have to think of that; people who knew what they wanted came demanding. But now it's time to tap the supply of people who are not quite aware of their need, and should be reminded.

It's Growing to be a RECORD Business

ONE business that is growing these days is the record business. Many more dealers handle phonograph records than before the war. The desire for individual choice of music, when and where and as often as wanted, has boomed this business beyond all former expectations

There are now over 180 record making companies listed in "Record Retailing," and the list is incomplete. More likely there are nearer 300. A large proportion of them are concentrated on the West Coast, and of these 50% in southern California. This includes big name companies.

But any dealer going into the record business should know that it takes a sizable stock, an inventory of several thousand, for a successful dealership. Also it is more successful when the dealer can judge the type of records his neighborhood and clientele will prefer.

Lately spectacular merchandising methods have been introduced into record promotion. Groups of individual old favorites have been reissued in albums. Children's sets are being made. Foreign and folk music sets are offered. International exchange of recordings is developing. Record people say that it may be as long as two years before they can press and supply any and all records in their catalogs, so big is the demand for the new sets and albums. Now every movie feature that has music in it carries with it a record promotion tie-in.

Accessory business too is good--needles, albums, carrying cases, cabinets. One big distributor advocates carrying 15% of the volume in accessories.

It is a traffic business and to handle records profitably it requires understanding its peculiarities, for there's a touch of show business to it that is important to its success.

In an exclusive press interview to Electrical West, supplementing the talk he gave before the San Francisco Electric Club and later that of Portland, the vice-president and general sales manager of Proctor Electric Co., Philadelphia

ROBERT M. OLIVER

urged

Let's Always KEEP Demand Ahead

ONE of these days we will be back where we were in 1939. There will be plenty of production and not so much demand, unless we create demand **now** for that time. The difference between 1939 and now will be that there are **more** of us—more manufacturers, more distributors, more dealers.

Everyone asks, when will production be up with demand? I hope it never does catch up. Your job and mine is to **KEEP** demand ahead of supply as long as we can.

Of course that can be done artificially by curtailing and controlling supply. But that is not consistent with North American temperament. An economy of scarcity is not our way of life. We are producers.

In the sales end of this industry, we are not or should not be concerned with production. That is increasing every day. The supply horse will catch up with and pass the demand horse in this team if we let it. But we must not let it.

What we must do is to expand and intensify **selling.**

What we need is not **merchandise**—there will soon be plenty of that. We will need, we do need now, merchandis**ing.**

There is merchandise around now. It may not be the **brand** that you or your customers want. There are even signs of price cutting to get rid of some of this unfamiliar and evidently unwanted merchandise.

If you cannot sell commodities right this minute, you **can** sell interest and desire now to be satisfied with the avalanche of merchandise that is sure to come.

Altogether too many dealers are complacently sitting back on their haunches and howling every time the phone rings or someone comes in the door to see something on display but which cannot be delivered right away.

What an opportunity is lost!

What would they give when times are slow for the chance to talk to that many people, to sell them something? Here they are coming in often, of their own accord. What a chance to sell them something—

Sell them an idea, a desire for an appliance you'll be glad to sell them later. Sell them that yours is a pretty nice place to come to, a good place to shop, to try again. The really smart dealers are doing just that, building customers to eat up that production when it comes along.

Right now is the **least expensive** time to sell. Invest in the future. Sell ahead. Create the demand now that will help dispose of the supply of 1947 and beyond.

It is time now to substitute **positive** thinking for **negative.** Merchandising is **positive,** creative. What I mean is:

1. **Advertise** regularly; feature known products.
2. **Display** well-known products in windows, on the floor and on counters.
3. **Demonstrate** continuously.
4. **Train salespeople** to know the features and how to sell them, how to show the products, how to utilize factory and distributor assistance and sales tools.
5. **Get orders** for future delivery now, even though some may be canceled or may not be filled for months.
6. **Keep samples** even of scarce merchandise at all times. Nail them down. But have them for customers to see, examine, try, order.
7. **Make sure** every customer knows that **his** needs come first even though it may be a long time before delivery can be made.
8. **Sell the advantage of waiting** for quality products even though inferior makes are immediately available.
9. **Teach salespeople** to sell up to better products that will make better pleased customers.

Handle All Repair Service so as to Please

Tenth of a series of good sense articles on business management

By Ken Hampton

A MERCHANT does business from day to day, adjusting to meet current conditions. Always his primary purpose is to serve the people in his community well enough that they will pay him a living, that is, a profit.

To do this, he must know their needs and make available to them the goods and service to satisfy their needs.

The repairing of appliances has not been looked upon as a profitable part of the appliance dealer's business. It has been carried on as a service to build good will and make additional sales. Now it suddenly has become the part of his business that is most important to him and his customers.

The situation presents both an opportunity and a challenge because with both manpower and materials short, it is more difficult to repair appliances, so the job must be planned for.

Here are some tips that have worked well and should serve as a foundation on which the merchant should build his repair and servicing activities:

1. It is well to remember that courtesy and orderly procedure are paramount for success in any undertaking that deals primarily with personal relationships where ailments are involved—and electrical devices that need repair are sick; the customer is being inconvenienced by their failure. Many times customers are irritated by the failure of the appliance as well as seriously concerned as to whether the appliance may be repairable, so they need first to be met in a pleasant manner and if possible reassured that the condition can be remedied. So first, the merchant needs a staff who approach customers with a service problem as an opportunity rather than an irritation.

2. He needs an organization of trained workmen to back up his contact personnel.

3. He needs an adequate stock of repair parts to back up his workmen.

None of these conditions can be met ideally, especially now, but the merchant can make it easy for his sales people to work with the customer—

1. By having a clear-cut standardized price policy on servicing.

2. By having a workable system that will enable the sales personnel to know when work can be promised.

3. By either making good on promises made or having an adequate reason available for the contact people as to why deliveries cannot be made.

4. By making terms clear. If possible all service work, as it involves labor, should be paid for in cash.

5. Insist upon his shop being kept clean and that mechanics keep their benches and tools orderly. This will impress customers who go into the shop. It will also have the good effect of keeping repairmen orderly and careful in their work.

6. Deliver the repaired appliance to customer in a spick and span condition. Be sure it is not only clean but polished if possible, and that all scratches are touched up. The little time spent to do this will pay big dividends because the customer will feel that he is receiving an added service.

7. Do the work in his own shop rather than in the customer's home whenever possible. In the home a workman is limited by space and lack of tools and can seldom do his best work.

8. Use manufacturer's service station facilities liberally to obtain product information, suggestions for saving labor and new methods of procedure. In many cases it is to the merchant's and the customer's benefit to have these stations actually repair the appliance and return it to the merchant.

Explain to your employees that in your appliance repair work you are really in the manufacturing business and that when a job is completely overhauled in your shop you want it to be in the best possible working condition. Based upon this attitude, backed by intelligent planning and careful management, your appliance repair business will be successful.

S.D. News Officers

Bureau starts first sales campaign on radio

Lou Wiese, of Wiese's Ltd., became the new president of the San Diego Bureau of Radio and Electrical Appliances at the election early last month, succeeding Frank J. Guasti, of Dohrmann's. It was no mere cut and dried elevation of officers from vice-president to president, this time, for many contests developed in the selection of directors.

O. G. Thompson, General Electric Supply Corp., was elected first vice-president, and Robert L. Swearengin, El Cajon Supply Co., second vice-president. Sam L. Hall, Electric Supplies Distributing Co., was re-elected treasurer. Directors elected to represent both the various districts in the county and the divisions of the bureau, were as follows: Harvey Byers, Churchill & Cassou Ltd., Escondido-Vista; Harry E. Callaway, Thearle Music Co.; A. K. Chamberlain, Refrigeration Equipment Co.; Albert Dryer, Dryer's Standard Furniture Co.; Paul A. Du Pont, Walker's; Glenn H. Dutton, Dutton's Radio Store; Paul Eklund, Eklunds Appliances, La Mesa; Harry Franz, Harrington's; Ralph French, French's Commercial Refrigeration; Frank J. Guasti, Dohrmann's, (Past President); Robert E. Harris, San Diego Standard Electric Corp.; Elmer B. Hazie, San Diego Auto Electric Co.; Jerry Heilbron, Heilbron Electrical Co., Carl Ince, Coronado Radio & Electric Co., Coronado; E. W. Kinmore, Kinmore Electric Co., Chula Vista; Ivan Lauritzen, Coast Electric Co., (Electronics division); Archie Marsden, General Electric Distributing Branch; E. W. Meise, San Diego Gas and Electric Co.; W. W. Powell, Coast Electric Co.; Al Reynolds, Reynolds Radio Co.; Robert Shaffer, Shaffer & Duff, Oceanside; Elmer Small, H. L. Benbough Co. Ltd.; Paul Weinstock, Weinstock's, El Cajon; J. F. Zweiner, Zweiner Electrical Co., contractors division.

First selling campaign since the war was launched by the bureau last month, to convince the public that table model radios are *now* available and that they are the postwar sets they have been awaiting. It is interesting that the advertising promotion was run in not alone the daily newspapers, but the *Shopping News*, the *Labor Leader* and a paper called *Industrial Times*.

Always active, the bureau has had a full program during the past month. The electrical contractors division met Sept. 3 to organize the certification of adequately wired houses. The electronics division had a technical meeting to hear talks on the oscilloscope and radar and sonar developments. Six technicians were awarded certificates by the coordinator for the vocational school, Lou Ferris, on completion of the post-graduate training program. A radio training course and an appliance service training program were started again. A sales training course was also started in mid-September with two classes, one for beginners, another for veteran salesmen who want to brush up on selling.

On the eve of his departure to attend the annual meeting of the International Assn. of Electrical Leagues, J. Clark Chamberlain, manager, said that he doubted that the proposed Electrical Show could be held this year. The building in Balboa park customarily used, has not been rehabilitated after being used by the Navy hospital.

Fill the Sockets

A promotion to sell incandescent lamps to fill the empty sockets is being featured in October and November by the Northern California Electrical Bureau throughout its area. With a slogan, "Time to relamp—buy lamps now to fill all empty sockets," posters and window banners are being supplied dealers. Pacific Gas and Electric Co. is likewise devoting its advertising space in 362 newspapers to the drive as well as attaching 600,000 bill stickers advising customers.

The adequate wiring booklet, containing specifications for the approved standards, is being given circulation also. Prepared by Jerry Hill, it is a pocket size booklet containing the standards arrived at by the wiring committee after months of discussion. Demand for the booklet, *Electricity in Your Home Plans* is likewise increasing, indicating interest in the subject on the part of GI's contemplating home building.

● PORTLAND'S HOME APPLIANCE SHOW, staged by the First National Bank of that city, Sept. 20-22, was a big success. Details of it were received too late to run in this issue but will be reported in the next ELECTRICAL WEST, along with pictures of the event. Twenty-three distributors participated, 6,000 dealers were at the preview, Sept. 19, and 80,000 people went through the exhibits eagerly looking at postwar appliances.

Sales Depot

Cooperative auction to appraise and sell them

Cooperative action by a group of electrical dealers in Vancouver, B. C., may solve the problem of used appliances. The plan in brief provides that appliances can be shipped to a central depot for auction sale, or they can be placed on assignment by dealers on the sales floor of this depot for sale at their own price. When sold by auction the dealer is charged 15% of the price secured, and when sold on the display floor a 20% charge is levied. The central auction and sales depot is located at 400 Broadway, West, and is operated by Household Appliances Ltd., and the Vancouver Auction Market Ltd.

A definite system of storage charges has been worked out on a monthly basis, and where an appliance remains unsold in the depot sales floor the scheduled charge is levied on it. Dealers can remove appliances from the depot at any time. In cases where appliances are sold on terms the dealer receives the same return as on the basis of a cash sale, and financing is arranged by the depot.

Arrangements can be made by dealers for the depot to repair and recondition any appliance on the basis of an agreed schedule of prices. In case of reconditioned appliances the depot will guarantee and service these for thirty days. Valuation of trade-ins will be made in the customer's home for the dealer by the depot, eliminating need for dealer appraiser.

Major points of merit in the plan are elimination of the room required on the sales floor for sale of used appliances; through use of a central appraiser dealers representatives do not bid against each other; facilitate a uniform trade-in allowance schedule; standardize both methods and prices in used appliances.

Adjoining the portion of the building devoted to the display area of Household Appliances Ltd. is the auction room area which will be used by the Vancouver Auction Market Ltd. This latter division will be under direction of J. Murchison, Vancouver auctioneer, while M. Allen is in charge of sales for Household Appliances, with P. J. Bennett as service and reconditioning department manager.

The plan is really only in its infancy as the appliance shortage has prevented any large volume of business, but it is felt that by instituting this cooperative move now the plan will be in full operation soon.

See Norge Line

Distributors of West get details from factory men

SHOWN first to the West was the 1947 line of appliances of Norge Division of Borg-Warner Corp., at two summer sales and training meetings in Denver and San Francisco, to which the various distributors for Norge came from surrounding territories. The appliances had been shown at the Chicago Furniture Mart and immediately were shipped to Denver where the initial meeting was held July 26 and 27 at Auto Equipment Co. Distributors from Albuquerque, El Paso, Billings, Cheyenne, Silver City, N. M., and even from Imperial Valley, attended that meeting.

Then just prior to the Western Merchandise Mart Market Week opening a similar two-day meeting was held at the headquarters of Leo J. Meyberg Corp. in San Francisco, Aug. 2 and 3, at which distributors from Imperial Valley, Las Vegas, Nev., Phoenix, Portland, Reno, Salt Lake City, Seattle, Spokane, and the Meyberg organization of Los Angeles and San Francisco attended.

Five new models of refrigerator were shown, four of them 7-cu.ft. models and one a 9, with price steps of an even $10 between models. Top model is a 7-cu.ft. one with a long vertical double freezer along one side. The frozen food capacity is up to 31½ lb. beside a 12-lb. capacity in its chilled meat tray. Not even the lowest priced model could be called a stripped box in any sense because it, too, had inside features often found only in more expensive models. The top three also contain the electric clock with automatic defrosting in the face of the vegetable bin at the bottom of the refrigerator.

The new range is equipped with an attractive fluorescent lamp. Two models of ranges were shown, each with an attractive control panel on the back splasher.

Selling features of all of the line

At the Norge distributors' meetings in Denver and San Francisco: W. S. Law, Norge manager of refrigeration sales, (top) showing the five models and the large side double freezer; center, E. L. Redden, sales promotion and training manager, shows R. Mitchell of Auto Equipment Co., Denver, the "tailored heat" controls of an electric range; below, R. Long, W. L. Bowden and H. Moeller, Portland, and F. Porter and G. Fanning, Seattle, all of F. B. Connelly Co., both cities

were shown by factory personnel. Also shown were new sales training charts and films. Most unique, though, was the actual building up before the audience of the electric refrigerator by two service men. The parts were assembled in packaged units, which would indicate also ease in taking a box apart for servicing. With such training material the distributors will hold similar training meetings for their dealers.

Twenty different models of Norge appliances were shown at the meetings including the refrigerators, two electric ranges, new gas ranges, home heaters, vertical and chest type freezers, portable water coolers and washing machines.

Factory personnel consisted of J. M. Tenney, Western sales manager, who acted as master of ceremonies at the meetings; W. M. Davis, national manager of gas range and home heater sales; W. S. Law, national manager of regrigerator sales; E. L. Redden, manager, sales promotion and training; C. R. Anderson and Tex McGovern, national field service representatives. At the Denver meeting M. G. O'Hara, vice-president and director of sales, was present also.

In attendance were representatives of Imperial Hardware Co., El Centro; Sierra Appliance Co., Las Vegas; Standard Equipment Co., Phoenix; F. B. Connelly Co., of Portland; Sierra Appliance Co., Reno; Salt Lake Hardware Co., Salt Lake City; F. B. Connelly Co., Seattle; and Columbia Electric & Mfg. Co., Spokane.

Stress Trade Ethics

A full day, a full dinner, and a full program made the Northwest Electric Appliance Assn.'s mid-summer meeting at the Riverside Country Club, Portland, quite an event. With Arnold Kuhnhausen presiding and a program of entertainment and speakers arranged by R. C. "Dutch" Brummer, managing director, following an afternoon of golf, the association redeclared its principles, extended a hand of cooperation to the other branches of the industry and set its face toward the fall merchandising season.

Brooks Manchester, Manchester-Chandles Co., appliance and radio dealer, former Pacific Power & Light salesman, had charge of the entertainment program. He introduced the Singing Sentinals, four men from the Kaiser Shipyard guard staff who have developed quite a reputation as a male quartet and have become recording artists for Sonora. Bob Reed, manufacturer's agent for Packard Bell in the Northwest, performed as a very clever magician. There were short talks by Harry Gevurtz and Harold Kelley, as well as Wynn Davis, of Eastern Outfitting Co. A hoax in the person of Gwynn Hoss, impersonating a presumable Dr. Natalini, erstwhile of Brazil, in broken English described conditions in that country which were meant to kid and warn the dealers.

Arnold Kuhnhausen reiterated the principles upon which the association was founded, those of developing a high degree of trade ethics among the appliance dealers in the Northwest. He told of meetings held recently at Eugene, Ore., and at Longview where units of the association were to be formed. Ted Korten, of Longview, vice-president of the association, sat at the head table beside him.

The full evening was brought to a close by the skit presented by William A. Cyr, associate editor, ELECTRICAL WEST, "Blame it on the Japs."

Where are Appliances?

Age old conflicts of interest between distributors and dealers, plus the current question, "Where are the appliances?" made the regular meeting of the Southern California Radio and Electrical Appliance Assn. Sept. 12, at Roger Young auditorium, quite a lively event. R. A. Cockfield, president, reported on the progress of the association to date and of the policy in respect to range installations of the Department of Water & Power. Representatives of manufacturers were quizzed as to the status of production.

Marshall Wells, Sues-Young Co., was appointed chairman of the sales conference committee because Jack Hargrove, former chairman, recently resigned to become executive vice-president of Miracle Electric Co.

● SUES-YOUNG CO. has been awarded the franchise of all California for a new brand of phonograph records to be known as MGM Records. They will be produced by a new recording company owned jointly by MGM studios and Loews' Inc. Records are to be processed in a plant recently acquired from General Electric Co., at Bloomfield, N. J., where 800 presses will have a capacity to turn out 40 million discs a year. Screen stars under the MGM banner will feature prominently in the line.

● AN ERROR was made in reporting the Home Show at Los Angeles in respect to the exhibit of Utility Appliance Corp. (See p. 81, Aug. 1946 issue). It was said that O'Keefe & Merritt was now a division of Utility Appliance Corp. It was intended to say that Gaffers & Sattler is now a division of that company.

Factory Men Answer

Bringing with them some of the inside facts regarding that ever-present question, "What's the matter with production?", J. H. Ashbaugh, vice-president, Westinghouse Electric Corp., in charge of the electric appliance division, Mansfield, Ohio, and T. J. Newcomb, sales manager for the appliance division at Mansfield, made a tour of the West in late September and conferred with the Westinghouse Electric Supply Co. and key dealers.

In a press conference questions were pumped at them by newspaper people and trade press. Explanations by Ashbaugh of the complexity of the problem were made clear.

For instance, he pointed out that to supply 10,000 dealers with six electric roasters each and 100 distributors with a stock of 100 roasters to back up the dealers would require a total initial demand of 70,000 roasters. Even with a plant capacity of 500 roasters a day, on a basis of 20 working days a month production for the first month would only be about 125 a day and not until the fourth month would the 500 a day be realized. Thus the total for the first four months would only be 25,000 roasters and it would require at least twelve months production before dealers could get their quota of six apiece.

Likewise explained was the influence of the lack of even such a small part as a machine screw or a hinge. These are supplied by subcontractors and if anything interrupts their flow the factory line has to stop too. Likewise, most manufacturers have had to turn all of their sales staff into expeditors to drive materials into the plant. He stated that production today is within 15% of the 1940-41 level but that any normal production today would not be felt because of the big backlog due to non-production for five years.

Questions were also asked as to the effect of OPA pricing and whether normal production could be gained under OPA at all. Newcomb stated he felt it could but it would take much longer because of the many adjustments that had to be made all along the line. Diversion of steel and other materials to the housing program also may cause a delay. This would cause, first, a material shortage and, then, a diversion of finished products such as refrigerators and ranges to the housing projects, rather than putting them in the regular trade channels.

Asked specifically if the Northwest was receiving its fair share of ranges in view of its high saturation, Newcomb explained the quota system based on 1940-41 quotas for those regions with due recognition of additional population to the area since that time.

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Distribution Economics

DISTRIBUTION systems of the Western power companies are going to be required to carry from two to five times more load per customer in the future than is the practice today. Most of this growth will be in the residential and commercial classifications. Herein lies a challenge to the distribution engineer. With constantly rising costs for both labor and materials, the engineers' problem becomes one of providing the maximum load-carrying ability with the minimum investment in facilities.

Three possible courses of attack are open. The first is to utilize every last increment of load-carrying ability in existing plant, including permissible overload capacity. The second is to study designs in the light of the greatly increased load densities with the idea in mind of reducing unit costs to the practical limit. The third is to encourage sales departments to seek out those classes of load that will give the maximum improvement in load factor.

The distribution systems of the future must be designed and constructed for longer use with a minimum degree of day-to-day change to accommodate more load. Utilization of improved protective equipment, provision for emergency capacity reserves, use of cable instead of open wiring, and assurance that transformers are loaded to the maximum are some of the measures that will contribute to this permanence.

The increased loads that are projected will mainly be in the low steps of the rate schedules. This means the sale of large blocks of energy at low prices—all in the face of rising costs. Sound economics demands the maximum skill, coordination and cooperation between utilities and manufacturers if these loads are to be served with investments and costs that assure the customer more electricity for less money.

No Load Moratoriums (We Hope)

IN speaking of distribution systems, one power company chief executive said recently, with considerably more feeling than facetiousness, that he was about to issue an order that no new major appliances could be connected to his system unless they were accompanied with the equipment to serve them. With current bottlenecks in transformers, insulators and other equipment and materials, he reported that his system was hard pressed to serve existing customer demands without considering any new loads. He was also in favor of declaring a moratorium on all promotional activities, appliance shows and like events until conditions improve.

In pointing up an acute situation on his own system, this executive merely emphasized one of the growing pains with which all Pacific Coast utilities are afflicted. Various remedial measures have been suggested. One is that companies announce that they will not connect any new major equipment (in fact this has been done in the case of electric heating by some Northwest companies). That course carries with it such bad public relations implications that any other measure would be preferable. It would appear that the best procedure is to worry along with hope and prayers that nothing blows up until some relief comes from equipment manufacturers.

Good Citizens at Work

A STRIKING example of public service in the ideal sense of the term is to be found in the industrial programs of various Western utilities. It is common to look upon these programs as simply another phase of advertising and hence as efforts calculated, by somewhat obscure reasoning, to pay off at some future date through added load. This view overlooks the fact that what utilities are really doing through these industrial programs is performing a community service—a service which is needed and which, for one reason or another, is not being aggressively sponsored by any single agency.

The appearance of electric utilities among those who have taken up the cause gains interest through the fact that the power bill is a very small percent of the total expenses of the average industrial concern. The fact that utility programs are not a small percent, but a large percent of the total industrial effort for the West, therefore indicates that utilities must be taking a broader view of the goal than the limited one of connecting new customers.

This broad view is in each instance based on the good of the community. Through the industrial programs new facts are being brought to light, numerous elements of the community are being given a helping hand, the common good is being furthered. This is good citizenship in action.

Who's Unfortunately Listening?

UNFORTUNATELY the amount of space which is available for the editorial presented here is too small to permit treatment of the subject in any detail. Several drawings accompany the editorial, but they are, again unfortunately, unsuitable for reproduction.

There are several interesting aspects to the subject which unfortunately lie outside the scope of the discussion. If the treatment we are able to give the subject here leaves questions in your mind, they will be answered, providing of course that space is available for them, and providing also that the answers are known.

With these limitations in view, it is obvious that we can hope to do no more than outline our subject in what limited space (as has been mentioned several times) happens to be available.

The subject is: The Presenting of an Engineering Paper. The question is: Why will engineers, year after year, submit to a long dissertation on what a paper is not, followed by a short, vague, poorly delivered and totally inadequate statement of what the paper is?

Cooperative Research

STANFORD UNIVERSITY has announced the establishment of the Stanford Research Institute for undertaking all types of research for industry, business and government. Not only does this step focus attention on the outstanding research accomplishments of Western colleges and universities during the war, but it fulfills a long-felt need in this region. Our only regret is that the development applies solely to this one university. The ideal setup would be a foundation which would place the research facilities of all Far Western universities at the call of business and industry in this region. Most of them already are cooperating with government as a result of the continuation of the wartime arrangements which produced so many valuable contributions to both the Army and Navy.

In the past there have been isolated instances of cooperative industrial research where the staff and facilities of a school were focused on a specific industrial problem. The electrical industry in this area, and more particularly the power utilities, have benefited immeasurably from this work. Stanford had its Ryan high-voltage laboratory where much original work on 220-kv. transmission was performed. University of California did notable work in hydraulics. Cal Tech investigated high-voltage transmission. Oregon State studied problems relating to insulators and Washington and Utah both worked on electrometallurgical propositions. Of recent years this research cooperation waned. It was supplanted by projects for various government agencies. This was logical during the war. However, now would appear to be the time for industry to come forward with its unsolved research problems. Stanford's announcement indicates that the universities are ready.

GOODS and guns belong to the world without; responsibilities the world within. The realization and acceptance of ethical obligations is a process that is much more difficult to induce in a human being or a nation than the production of munitions in a factory. Yet the willing assumption of moral responsibility—civic virtue—is the determining factor in the building and maintaining of a high level of civilization. Honor among nations and individuals lies in the maintenance of high standards of conduct; the keeping of the spoken word; the sanctity of agreements and treaties; the strict observance of bargains and contracts. Honor without conscience is impossible. Power without intelligence leads to chaos and tyranny. Hence, education that does not mould the entire man—mentally and morally—is lethal poison for the individual and social dynamite for popular self-government. As part of the process of revitalizing our own faith, we must also restore our historic reliance on the vigor of individual initiative.

That reliance has been seriously undermined in the last decade. We must learn to spurn beguiling offers of government aid on the one hand and stop soliciting such assistance on the other. If we do not, we shall find ultimately that we have traded our birthright for a mess of pottage of bureaucratic control.—H. W. Prentis, Jr., President, Armstrong Cork Company.

RMEL Sizes Up the Future Situation

All branches get together at Estes Park for a look at each other's problems and to seek ways to improve the business for everyone in it

INDUSTRY cooperation, rural electrification, bottled gas competition, lighting promotion and human engineering were among topics discussed at the 42nd annual convention of the Rocky Mountain Electrical League, held at Estes Park, Colo., Sept. 5-7. Grover C. Neff, president of the Edison Electric Institute, was one of a number who came from far distances to attend the meeting. Neff made a plea for greater support by utilities of their own industry associations and asked them especially to go along with the program and recommendations of the coordinating committee which has been set up to correlate the work of the several utility associations. Speaking for EEI, he said that benefits exceed by many times the dues.

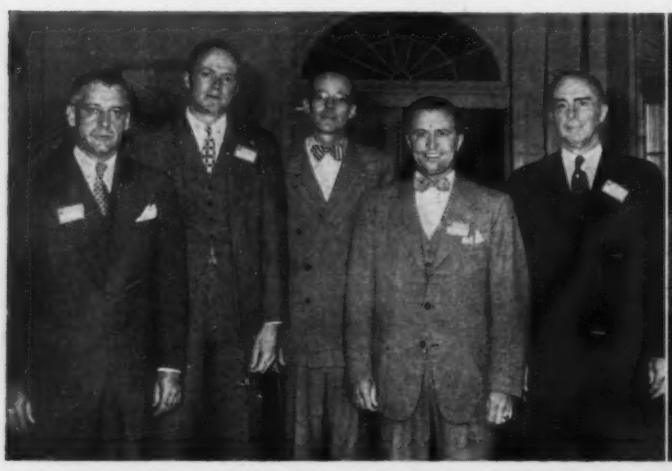
He dwelt at some length on the rural electrification problem, saying that the private utilities started the job and now serve 60% of the electrified farms in the nation and that they should now finish the job. He said it would be wise to approach co-op managers and directors in a spirit of friendliness and cooperation. It should be possible to work out with them in a friendly way, a division of the territory yet unserved and to have a definite understanding with them on just what the co-ops are going to do and what the operating companies are going to do. Such a plan would bring orderly development from here on in and benefit both the co-ops and the operating companies. Neff does not believe that the big majority of farmers will lend themselves to the effort of some elements in the federal government to use the REA co-ops by making them play a big part in the complete socialization of the electric power industry.

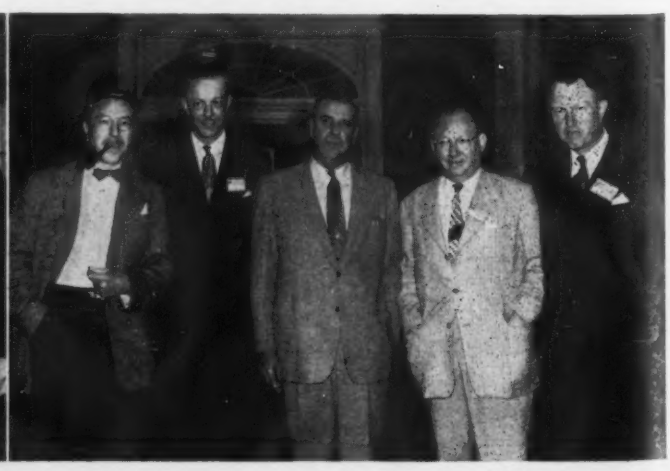
Warren Terry, Home Gas & Electric Co., Greeley, reporting for the rural electrification committee of RMEL, said that a policy had been set up for welders that requires such equipment to carry a name plate with full data. Maximum power requirements are limited to 37.5 amp. at 230 volts. Power companies reserve the right to seal off higher taps, or make an appropriate charge for higher demands, or to install a breaker to limit current to 37.5 amp. He outlined the work with 4-H clubs and of the committee's farm adequate wiring program. He said that the power companies have the largest investment and the greater interest in farm customers and urged that utilities do more in the way of advertising; of providing farm specialists, and in furthering the program of rural committees.

More than a billion dollars in revenue have been lost to utilities from bottled gas competition to date, declared Paul M. Augenstein, General Electric Co., Bridgeport, Conn. The liquid petroleum gas interests have spent 20 years developing the bottled gas business against disorganized competition while we have all been asleep, he said, but the electrical industry has now finally awakened to the seriousness of the situation. The only way to meet this competition in his opinion is to conduct a campaign of education that will inform all branches of the electrical industry on every phase of bottled gas. We must spend some money, he said, in educating ourselves; educating our farm customers; in providing farm specialists and home service girls; and, since the cost of installation is a major factor in selling electric service, we might well consider wiring subsidies. Survey your territory and know your market and don't let the present period of short supply cause us to underestimate our competition, he admonished.

The electrical contractor is the No. 1 public relations man of the industry and is hard at work to make himself the best salesman in the industry, said George B. Roscoe, National Electrical Contractors Assn., Washington, D. C., in telling of the work of his organization in educating the contractor to be a better business man and in elevating his position in the industry. He decried the efforts of some government officials in Washington to socialize the industry through REA and said NECA was putting up a strong fight against the practice of REA to furnish all material and thus place the electrical contractor in the position of a labor broker. The electrical contractor cannot survive as a labor broker only, he declared, and he doesn't understand why some elements within our own industry persist in by-passing the contractor by selling material direct and making a labor broker of the contractor. After all, he said, it makes little difference in the cost of the job to the customer because, if the contractor does not sell the material and place some of his cost of doing business on it, then he must charge it all to labor. The electrical contractor is on the march to reach his goal, de-

Thatch Sweeney Johnson Names Munroe Adler Rankin French Tengdin Johnson





Storey French

clared Roscoe, and he asked the support and cooperation of other branches of the industry in helping him to realize it.

Speaking of the status of lighting today, Ward Harrison, General Electric Co., Nela Park, made a plea for banishment of glare—the greatest deterrent to better lighting—for we are only limiting our own market if lighting is uncomfortably bright, he said. We have just talked about glare for 40 years, but we are now in a fair way to get a numerical factor for glare which will prove just as useful as the foot-candle in calculating lighting jobs. The other factor in good lighting is enough foot-candles for comfortable seeing. Harrison said that since fixture sales are now running 90 to 95% fluorescent, we are going to have to run fast to stay where we are on a wattage replacement basis. We can no longer judge the effectiveness of a sales force by kw. added—we must hold and consolidate our gains, he said.

Harrison warned that we cannot expect to hold war gains in higher intensities except by aggressive, planned selling and that there is no substitute for a face-to-face meeting with customers, if we expect to avoid the tendency to replace incandescent on a watt-for-watt basis. He urged that the present short supply period be taken advantage of by fixture dealers, contractors and utilities to train sales forces for the day when the sellers' market will be over. Asked whether fluorescent would completely displace incandescent, Harrison said no—the two types complement each other. He said there are between three and four billion sockets in America and, with cost of fluorescent about $10 per lamp, it would cost over 30 billion dollars for replacement.

James T. Coatsworth, EEI, echoed the sentiments of Harrison when he said that persistent, hard plugging will still be the way load will be built when the present sellers' market ends. He urged member companies to take full advantage of the many splendid EEI training courses now available to school sales forces for the big load building job ahead.

C. F. Wagner, central station engineering division, Westinghouse Electric Corp., East Pittsburgh, predicted that atomic power, when developed, would have little effect upon cost of power to the ultimate customer. He recited some of the difficult problems involved in building an atomic power plant and presented a series of curves showing his analysis of comparative energy costs from fission of uranium and burning coal. Steam station costs for large modern high-efficiency plants in 1940 were about $90 per kw. of installed capacity. With 15% annual charges, including labor but not fuel, and 50% load factor, cost of energy would be 3 mills per kwh. Figuring a uranium plant at $120/kw. and the same annual charges and conditions as for coal, energy would cost 4 mills, without the "fuel." No one knows what concentration of uranium would be used nor its cost, but he said it could be that a very high purity would be used, in which case a single firing would last many years. Under such conditions, the cost of fuel would be capitalized. In any event, he said, with the cost of fuel being only 11% of the price of power to the ultimate consumer from our present steam plants, and because of certain high unit costs for atomic power plants, it appears to him that nuclear energy will not prove a panacea for low-cost delivered power.

Productiveness of labor has got to go along with the tempo of our peacetime economy or we are headed for economic collapse, said F. F. McCammon, vice-president, Public Service Co. of Colorado. He warned management not to delegate labor problems to third- and fourth-level men if it hopes to maintain satisfactory labor relations. Only top management with authority to make decisions and back them up should handle labor problems, he declared. He thinks that many

Collier Roscoe

Terry Augenstein

of labor's abuses of the improved working conditions that have been granted, can best be cured by letting the men themselves police some provisions of contracts.

Speaking on another subject, that of the attributes employers are going to demand of your engineers out of college, McCammon said that colleges must give students some picture of the humanities of the business they are going to enter. The engineer has got to learn to get along with his fellow men—and this is a vital part of education of college students, he declared.

A round-table discussion on industry cooperation, with W. C. Heston, *Electrical World*, as discussion leader, brought out from manufacturer, distributor, contractor, dealer and utility spokesmen the fact that, only by helping the contractor and the dealer to strengthen his position and by the manufacturers and distributors maintaining ethical policies of distribution, can all branches of the industry achieve their common objective, that of developing electrical usage and securing for the industry a larger part of the consumer dollar. R. H. Thatch, Westinghouse, St. Louis, said that manufacturers were doubling their facilities to produce motors and warned that, oddly enough, in 1947 we might find ourselves in the position of having to go out and *sell* motors instead of taking orders. B. K. Sweeney Jr., Sweeney Electric Co., Denver, said that the only way to keep present channels of distribution is for each branch of the industry to perform his function efficiently. Distributors must keep costs down and dealers and contractors must build their own houses if they want to meet chain store competition and other short cuts in the distribution picture. Ralph E. Johnson, Sturgeon Electric, Denver, said that contractors are stronger than ever before as a result of lessons learned during the war and through the work of their national organization. He brought out the same point made by Roscoe, that the contractor cannot survive as a purveyor of labor only. If the elec-

trical contractor can furnish labor and material, it will cost the customer no more and labor will not be burdened with all his costs of doing business, as is the case if the contractor is bypassed on the material. Moreover, he said, if the contractor can do the whole job, he is then in a position to service the installation properly—a function all-important to the entire industry. Contractors realize that many of their troubles lie in their own back yard, but they are alert to the situation and, through both national and local approach, they can be depended upon to hold up their leg of the five-legged stool of industry functioning, he concluded.

Herb Names, Names Electric Co., Denver, said that those dealers who spend some time in their offices working on their current problems will be those that survive. In this critical and chaotic period, he said distributors should give more consideration before taking on opportunist accounts that come their way and that dealers should likewise be careful in their selection of distributors. He asked distributor and manufacturer representatives not to hide behind the old "factory policy" stall. Don't alibi—either believe in it and substantiate the policy or work to have it changed, he said. "If we want to get a bigger share of the consumer's dollar we'd better spend more time selling new appliances than on the ones the public was going to buy anyway," he admonished.

Speaking for the utilities, Roy G. Munroe, Public Service Co. of Colorado, said that the utility business was unlike mercantile establishments, in that it must depend for expansion of the business upon increased sales per customer rather than upon new customers. It is because of this that the power company is so vitally interested in load building to increase consumption per customer. He had no criticism of other branches of the industry. He traced the evolution of utility merhandising and pointed out that most power companies have shifted over to the dealer such of the load building job as they feel the dealer has demonstrated he is capable of doing. He feels, however, that the dealer and the whole industry fares best under a policy where the utility continues promotion and dealer aid on new appliances and on uses that have not yet received full public acceptance.

A very successful convention might well have concluded with the words of Ward Harrison when he said, "We are all prone to jump at conclusions—let's not be too hasty in misjudging our fellow industryman and our competitor—let us do everything we can to eliminate distrust and misunderstanding."

The following officers of RMEL were elected for the coming year: president, J. B. French, president, Black Hills Power & Light Co., Rapid City, S. D., succeeding Luke Storey; vice-president for Wyoming, W. D. Johnson, vice-president and general manager, Mountain States Power Co., Caspar, Wyo.; vice-president for Colorado, Harold T. Rankin, superintendent lighting department, Public Service Co. of Colorado; vice-president for New Mexico, E. T. Tengdin, vice-president Inland Utilities Co., Kansas City, Kan.; vice-president at large, Harold L. Vaughn, Mountain States Machinery Co., Denver; treasurer, W. C. Stern, and Harry Adler assistant treasurer, both of Arvada Electric Co., Denver. Ralph B. Hubbard was reappointed manager of the league.

Harrison Loiseau

Wagner Noyes

Clark McCammon

NCEB Unit Reorganized

A unit of the Northern California Electrical Bureau, the Yuba-Sutter Gas & Electric Appliance Assn., has just been reorganized in the Marysville-Yuba City area. Carl Syvertsen, Syvertsen & Sons Electric Co., of Marysville, was elected president; D. E. Carter, Bremer's Hardware, Yuba City, vice-president; and Dan Alexander, PG and E Co., Marysville, secretary-treasurer. Directors chosen were A. L. Ballen, Montgomery Ward & Co., Marysville; Francis Becker, Becker's Auto Supply Co., Marysville; John Kirby, Radio Center, Yuba City, and Louis F. Putnam Sr., Putnam Home Appliances, Marysville.

The organization had previously been active but since 1942 had ceased to function. The charter meeting was held Sept. 24 at Marysville whereupon a charter was presented by the board of directors of the bureau head office. The organization will hold regular meetings and operate local campaigns of promotion and advertising.

Other Northern California Electrical Bureau units are operating in San Francisco (continuously since before the war) East Bay or Oakland area, San Jose, Chico and Fresno.

● FALL CONVENTION for the Pacific zone of the National Electrical Wholesalers Assn. will be held at Sonoma Mission Inn, Boyes Springs, Sonoma County, Nov. 13 to 15, according to R. A. Balzari, secretary of the Pacific Division. C. W. Matthews, chairman of the program committee, is developing a program of interest both to the supply and the appliance wholesalers. Customary golf tournament will be held.

● BUSINESS DEVELOPMENT Section of the Northwest Electrical Light & Power Assn. may have a planning meeting sometime during the week of Nov. 11 and possibly in Seattle. At least this was the hope of Chairman Henry Kruse.

● ANNUAL MEETINGS of the Northwestern and Southwestern Sections of the International Association of Electrical Inspectors, at Boise and Sacramento, respectively, are being held too late in the month for a report in this issue. Full reports will appear in the November issue.

House heating problems were discussed in a paper by J. B. Cochran of the Bonneville Power Administration at the Sept. 7 regular chapter meeting of the Puget Sound Chapter, International Association of Electrical Inspectors, held in Tacoma.

Southern California Chapter, IAEI, will hold its next meeting Nov. 20 at Burbank to discuss a variety of inspectors' problems.

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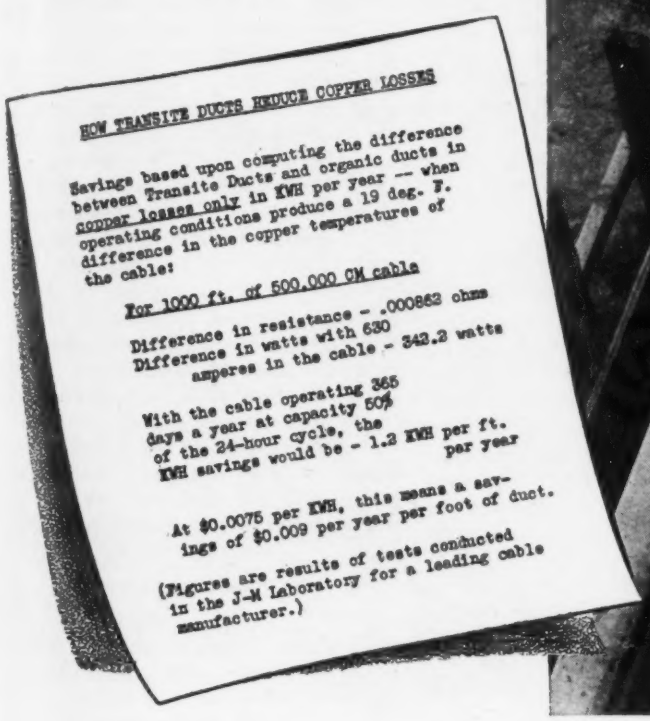

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Fall Conference

Scheduled for Fresno December 5 and 6

Plans are shaping up for another worthwhile Fall Conference, scheduled to be held in Fresno on Thursday and Friday, Dec. 5 and 6.

Arrangements are being completed for the Operating Economics Section meetings to be held in the Hotel Fresno and for the Business Development Section meetings to be held in the Hotel Californian. Meetings of the customer relations group of the Administrative Services Section also will be held in one of the two hotels.

Opening meeting of the conference will be a general session, to be attended by all delegates, in the Hotel Californian. This will be the only general meeting of the conference, except the two luncheons, and arrangements for the program will be made by the newly created personnel committee.

The first day's luncheon meeting will be held at the Hotel Fresno and the second day's at the Hotel Californian, with the advisory committee acting to coordinate the two events. The other one and a half days of the conference will be devoted to separate section meetings, held concurrently in the two hotels.

The Fresno Fall Conference is being arranged by the guidance committees of the sections. K. L. Hampton, guidance committee chairman, and E. W. Meise, vice-chairman, will arrange the Business Development Sections meetings, and the Operating Economics Section meetings will be arranged by C. J. Nevitt, chairman of the guidance committee, and A. D. Bragg, vice-chairman. Other meetings of the Administrative Services Section will be conducted throughout the year and will be arranged by the guidance committee chairman and vice-chairman, L. S. Heseman and George Henderson.

Adequate Wiring

Elbert Kramer, chairman of the adequate wiring committee, conducted the meeting of his group held in Los Angeles on Sept. 4 and outlined the progress made during the past year. He reported that the standards developed for use as a basis for the certification program throughout the state had been approved by the National Adequate Wiring Bureau and that licenses to conduct the certification program had been issued by the National Bureau to the Northern California Electrical Bureau, the San Diego Bureau of Radio and Electrical Appliances and the Pacific Coast Electrical Bureau. Copies of the standards, prepared in booklet form by the San Diego Bureau and in single-sheet form by PCEB, were distributed to committee members.

Following considerable discussion regarding the most advisable form for such a promotional piece, the committee approved the suggestion of G. F. Wismer that a promotional folder be prepared for distribution to prospective home owners to acquaint them with the advantages of adequate wiring in new and existing homes. Preparation of the folder was delegated to the publicity committee.

Business Development

The guidance committee of the Business Development Section met in Los Angeles on Sept. 4, with chairman K. L. Hampton presiding. The committee heard reports from the section's various committees and discussed the program to be arranged for the Fall Conference. Among other events, the committee expects to present a speaker on the subject of housing in California and a report from the liquid petroleum gas committee.

H. C. Rice gave an outline of the organization of the newly appointed electrical living committee, and explained that this committee had been formed for the purpose of coordinating all domestic promotional activities. After some discussion, the following were appointed as chairmen of subcommittees to function under the supervision of the electrical living committee: B. M. Tassie, modern electrical kitchen committee; F. S. Fenton, home laundry committee; Miss Marguerite Fenner, home economics committee; L. A. Hobbs, home lighting committee and Elbert Kramer, adequate wiring committee.

● NOW FUNCTIONING is a president's advisory committee consisting of the chairmen and vice-chairmen of the three principal sections of the PCEA. Purpose of the committee is to coordinate programs and activities of all of the sections and at the same time review and prepare recommendations on many matters heretofore going directly to the board of directors. President M. G. Sanders inaugurated the policy in the interest of organization streamlining.

Board Meets

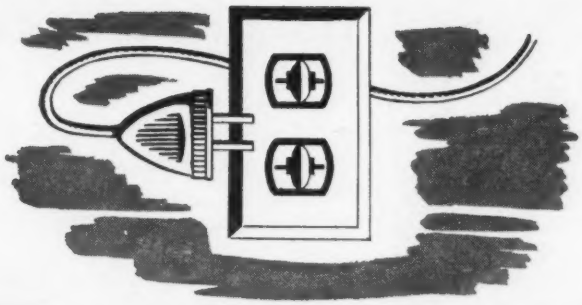
During a meeting held Sept. 12 in San Francisco, the Board of Directors approved the booklet entitled *Know Your PCEA,* which has been prepared by V. W. Hartley, managing director, upon the recommendation of the advisory committee. The booklet is designed to acquaint members and prospective members with the purpose and function of the association and will be especially helpful in informing members regarding the operation and purposes of the various committees.

At the same meeting, President Sanders recommended that the by-laws be amended to permit the various guidance committees to be enlarged. He pointed out that the by-laws now restrict guidance committees to a chairman, vice-chairman and nine members, and that this makes it difficult to secure proper representation, both geographically and by industries. He proposed that an amendment be prepared to allow each guidance committee to be composed of a chairman, vice-chairman and up to 15 members. The directors approved the amendment, which will be presented at the next annual meeting for formal ratification.

New Personnel Committee

President Sanders pointed out the need for a program to encourage a spirit of job pride and industry pride among workers in the electrical industry. The need is especially apparent among newcomers to the industry and some of the returned servicemen who have undergone harrowing experiences, it was brought out, and the directors approved the appointment of a personnel committee to work out a suitable program. The board was informed that the matter has been discussed by the advisory committee and the guidance committee of the Administrative Services Section, both agreeing that the problem requires a long-range campaign to be fully effective.

The appointment of a personnel committee to undertake the project was approved by the board. Committee members appointed are: J. A. Long, Southern California Edison Co., chairman, representing utilities; Walter Vance, Pacific Electric Motor Co., Oakland, representing contractors; F. C. Todt, G. E. Supply Corp., representing distributors and H. H. Fogwell, Thermador, representing electrical manufacturers.



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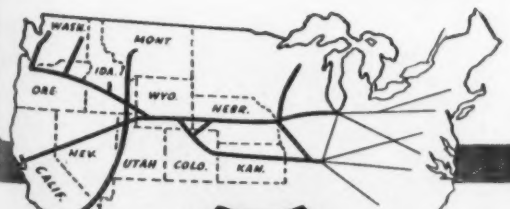

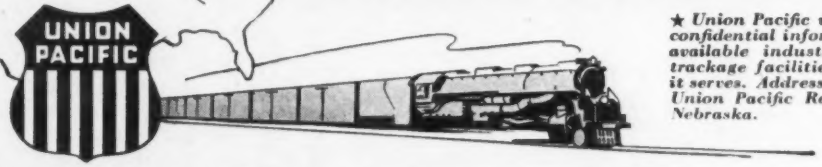

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Tracy Returns as IBEW President

San Francisco convention develops ballot battle for leadership of electrical union

DAN TRACY, favored by a majority of Western locals of International Brotherhood of Electrical Workers, went back into office as president, after a hot verbal and ballot battle at the San Francisco convention of IBEW in San Francisco, Sept. 2 to 10. He won over Ed J. Brown, incumbent, who succeeded him when Tracy accepted appointment as Assistant Secretary of Labor from the late President Roosevelt. It was a close race, Tracy winning by about 3,000 votes. His slate of vice-presidents, elected later, however, won by increasingly large Tracy majorities.

J. Scott Milne, vice-president for District Nine, San Francisco, a Tracy supporter, was re-elected. His opponent was E. P. Taylor, manager of Local 18, Los Angeles. W. H. Bell, of Denver, vice-president for District Eight, was defeated by W. C. Wright of Pocatello. Charles Foehn, manager of Local Six, San Francisco was likewise re-elected to the executive council; he was opposed by William Gaunt, manager of the Seattle local.

Although police declared they had been warned to look out for violence, the convention, though tense from the battle for leadership within its ranks, was orderly and businesslike. Feeling had been intensified by the firing of 22 international representatives by Brown just prior to the convention. He accused them of political activities. From Milne's staff Brown had dismissed Otto Rieman, George Mulkey, William Myers, Oscar Harbak, M. B. Keeton and Charles Hughes.

Tracy promised to reinstate them if elected, and action was taken by the convention recommending that Brown immediately reinstate them, not leaving them jobless until Tracy takes office, Jan. 1. Action was also taken to change by-laws to install new officers within 30 days of election, rather than waiting until the first of the year.

The joint pension program, sponsored by both the National Electrical Contractors Assn. and the IBEW, was approved and pensions were increased from $40 to $50 per month but no reduction was made in the age pensions start — still at 65.

Other policy changes voted were: allowing women to become eligible for office after five years in good standing; creation of post of government employee representative (similar to railroads) with headquarters in Washington, D. C.; creation of an AB membership with right to vote on all matters except pensions or insurance (B members, who had not applied for insurance or pension benefits formerly only had one vote per 100 members); formal opposition to exportation of any building materials until all U. S. needs are supplied; reaffirmation of a national apprenticeship training program; increase of president, secretary, treasurer and vice-presidents' salaries. (The president will receive $15,000 instead of $12,000; vice-presidents $8,500 instead of $5,900).

A dinner for IBEW officers was given, Aug. 16, at Hotel Mark Hopkins, by the San Francisco Electrical Contractors Assn., Tom Harris, presiding and W. J. Varley, manager, making the arrangements. A cocktail party was given them by the Northern California Chapter, NECA, at Claremont Country Club, Aug. 28, R. V. Carey, manager, making the arrangements. Local Six of San Francisco, Marin and San Mateo counties was host to the convention ball at the civic auditorium, D. E. Goodenough, president, and Charles Foehn, business manager of the local, presiding.

● ALL of the Spokane Chapter members, NECA, are going to attend the convention at Atlantic City, according to Paul Heydon, chapter manager. The chapter pays part of the expenses of members who wish to attend. Heydon, also representing all of the building trades in the Spokane area, recently made a trip to Washington, D. C., to interview Paul Porter, head of OPA, and protest against the inequities of Regional Order No. B-22 under RMPR 251.

● NEW OFFICERS of Rocky Mountain Chapter, National Electrical Contractors' Assn. took office Sept. 15, following election Sept. 1. Ralph Johnson, Sturgeon Electric Co., Denver, was named president; Bert W. Stiles, Denver contractor, vice-president, and Donald Larson, Omaha, Nebr., general manager. Directors are Everett Collier, retiring president, who automatically takes his place on the advisory council, Joe Holt, Boulder, Colo., Francis Fitch, Cheyenne, Wyo., Paul Jussel, Denver, and George Forester, Casper, Wyo. Larson, an attorney, succeeds Pat Price who resigned to enter business for himself as an electrical appliance dealer in Denver.

Northern Calif. NECA

Advantage was taken of the presence in San Francisco of Paul Geary, executive vice-president of the National Electrical Contractors Assn., attending and speaking before the IBEW convention, to hold a special meeting of the Northern California Chapter, NECA, at Athens Club, Oakland, Sept. 10. Ed Buttner, Scott Buttner Electric Co., Oakland, governor of the Northern California Chapter, presided in the absence, due to illness, of D. Bronson, California Electric Co., Oakland, president. Also present was Ernie Hedler, manager of the Philadelphia Chapter of NECA, and Al Martin, field representative, NECA, Division Six. T. L. Rosenberg, vice-president, Division Six of Oakland, likewise was present.

Geary spoke of the NECA program, declaring that all problems which affect an electrical contractor have both a local and a national aspect and that

Brown Varley Harris

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Paul Geary, NECA executive vice-president, addressing Northern California Chapter, at Oakland. Al Martin, Div. 6 field representative, Ernie Hedler, Philadelphia Chapter, Ed Buttner, T. L. Rosenberg, Division 6 vice-president

both a local chapter organization and an affiliation with a strong national association were necessary to assist contractors to meet these problems. The major problems, he declared, were those of materials, labor, codes, competition, and government regulations. The individual cannot cope with these problems himself but needs the assistance of his fellow contractors in each locality as well as of the combined strength of contractors in the country.

Hedler told of the organization and work of the Philadelphia Chapter and its relationship with the Electrical Assn. of Philadelphia.

T. L. Rosenberg complimented the Northern California Chapter organization and its manager, Ray Carey. The latter presented 27 new membership applications to Geary, mentioned that branches had been established in Santa Cruz, Watsonville, and Bakersfield with the likelihood of others soon to be affiliated with the chapter. After talks from the men, the meeting was thrown open for questions about national policies, labor situations, apprenticeships.

Lighting Meetings

The first association in northern California to take advantage of a lighting sales training program worked out cooperatively between the National Electrical Contractors Assn. and General Electric Co. Lamp Department has been the San Francisco Electrical Contractors Assn., Inc. with a series of three store lighting meetings Sept. 10, 17, and 24 at Scottish Rite Temple, San Francisco. Thomas Harris, president, and Morris D. Hixson, manager of the lamp department, Oakland, as well as wholesalers of lamps, distributed invitations to electrical contractors in the San Francisco area. Attendance at these three meetings was exceptionally good for San Francisco, with a large percentage of contractors in attendance. Walter Carlson, of the lamp company, presided at the meetings. Sam Hazelton, illuminating engineer, presented the training material, made the demonstrations of equipment and light sources. Motion pictures and sound-slide films were used to supplement his instruction course. Instead of the usual four meetings, the material was condensed into three. Average attendance was about 100 for each meeting, including contractors, lighting personnel of the utility company, wholesaler salesmen, architects, engineers.

● How the new 1946 National Electrical Code will affect lighting installations and lighting fixtures was discussed before the Northern California Chapter, Illuminating Engineering Society, at San Francisco Sept. 23, by Harold L. Gerber, chief inspector, department of electricity, San Francisco. Installation of new officers was also made when William A. Cyr, associate editor, ELECTRICAL WEST, relinquished the chairmanship to Ellis Willits, Associated Oil Co., and made a presentation of certificates to eight full members.

● SPOKANE SECTION, AIEE, was host recently to J. Elmer Housley of Alcoa, Tenn., national president of the group. Housley spoke on the channeling of war-gained knowledge in all scientific fields into the electrical engineering field. He forecast application of new scientific knowledge to improve the nation's economic situation and raise its standard of living.

Utah Chapter, IAEI, plans to hold regular meetings Oct. 1 and Nov. 5 for the discussion of code problems. Meetings will be held at Utah Power & Light Co. auditorium in Salt Lake City.

Utah NECA

Once again there is a Utah Chapter of National Electrical Contractors Assn. On Aug. 5 its charter was granted and George A. Howarth, recently returned to inactive status with the rank of colonel, U. S. Engineers, was appointed manager, according to A. E. Martin, field representative of NECA, who helped Utah contractors organize the chapter.

A. N. Sisam, Sisam Electric Co., Salt Lake City, was elected president and also member of the board of governors for the chapter. Henry Lobb, Cache Valley Electric Co., Logan, is vice-president, and M. A. Strand, Strand Electric Co., Salt Lake City, is treasurer. On the board of directors are: M. E. Dansie, Fred C. Wolters, both of Salt Lake City, and L. A. Herdti and G. E. Wilson, of Ogden. Offices of the Utah chapter NECA have been established at 502 Templeton Bldg., Salt Lake City.

Howarth, born in Salt Lake City, is an electrical engineering graduate of University of Utah, 1922, took the General Electric test course at Schenectady, and worked for Utah Power & Light Co. from 1923 until he entered the Army in August 1940 as captain. At that time he was industrial sales supervisor. In the Corps of Engineers, Howarth was assistant recruiting officer, project officer, constructing quartermaster in charge of construction of the shell loading plant at Ogden arsenal: area engineer at Tooele Ordnance Depot, Wendover Air Base, and chief of operations in charge of military construction, San Francisco Engineer District from July 1943-January 1946. He is a member of AIEE, ASME, Utah Society of Professional Engineers.

Howarth

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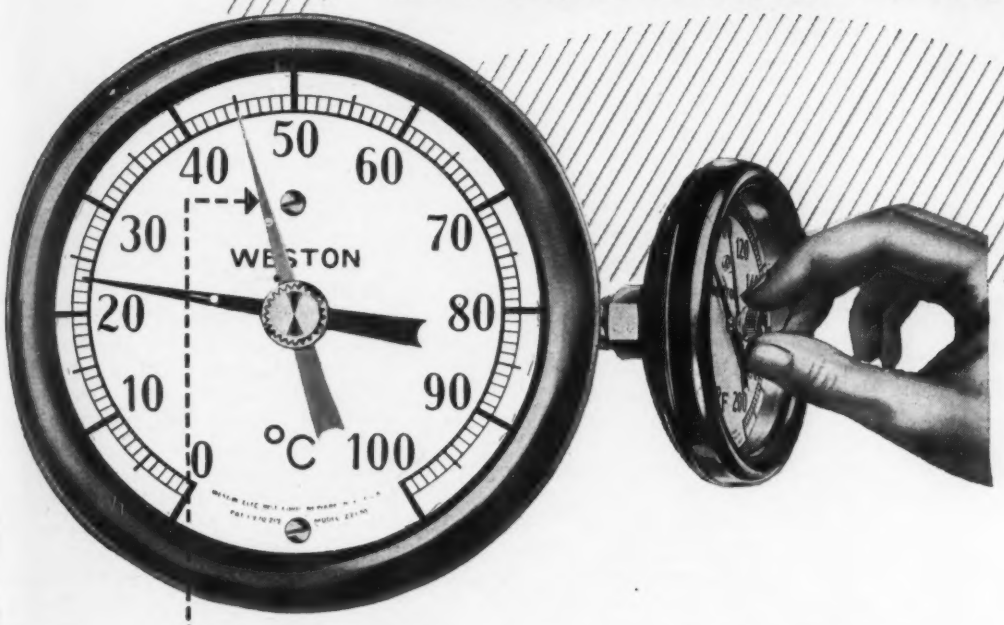

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Midwest NECA Group Meets in Colorado

Coast representatives also participate in the Division Five conference on labor and management

DIVISION Five, National Electrical Contractors Assn. held a sparkling series of meetings in connection with its fifth annual convention at Manitou Springs, Colo., Aug. 28-30, inclusive, with straight-from-the-shoulder messages delivered by nationally prominent personages who are fully cognizant of contractors,' journeymen's and apprentices' problems.

Two addresses of welcome, by Earl L. Mosley, city manager of neighboring Colorado Springs, and by Everett Collier, Rocky Mountain NECA chapter president, were followed by the response of L. T. Allen, vice-president of Division Five, whose inspiring speech started three days of incisive examination into the electrical industry, from utility management to contractors' public relationship attitudes—touching on veteran employment and labor conditions enroute.

Cliff Noxon, regional director of the U. S. Department of Labor's apprentice training program, submitted a one-to-five formula for determining the correct number of apprentices to be trained in any area under union jurisdiction. Simon Halle, chairman of the Colorado Springs Associated Trades Apprenticeship committee, dealt with the same general topic, describing local training experiences and techniques.

Ralph L. Johnson, Sturgeon Electric Co., Denver, boldly advocated state laws to govern the issuance of licenses to electrical contractors, journeymen and apprentices, stipulating standards of performance on a basis of training, experience and adaptability. Such control legislation, he pointed out, will be of vital importance when current conditions simmer down to a competitive basis, such as prevailed before the war, and will again return.

A proposed plan of procedure whereby electric utilities would go along with other branches of the industry on merchandising, wiring installations, etc., was submitted by Ted Foulk of Public Service Co. of Colorado. His program would define the power company's position on appliance sales and contracting jobs in such manner that it would coordinate, rather than compete with, private firms and individuals.

A General Electric Co. movie, *More Power To America*, dramatically visualized how more horsepower per man in industry can be achieved through an all-embracing alliance among manufacturers, utilities, contractors and engineers. This preceded an address by W. H. Clayton, Dallas, Tex., vice-president of G-E on Wholesalers and Manufacturers' Plans, with an eye to what the future has in store. He said the region covered by NECA Division Five is subject to tremendous industrial development containing, as it does, about 28% of the nation's area, 4% of the population, and some 6% of the country's invested industrial capital.

Henry Gable, president of NECA's Northeast Texas Chapter defined the contractor's place in the electrical industry, urging a proper relationship between contractors and manufacturers with less reliance on jobbers.

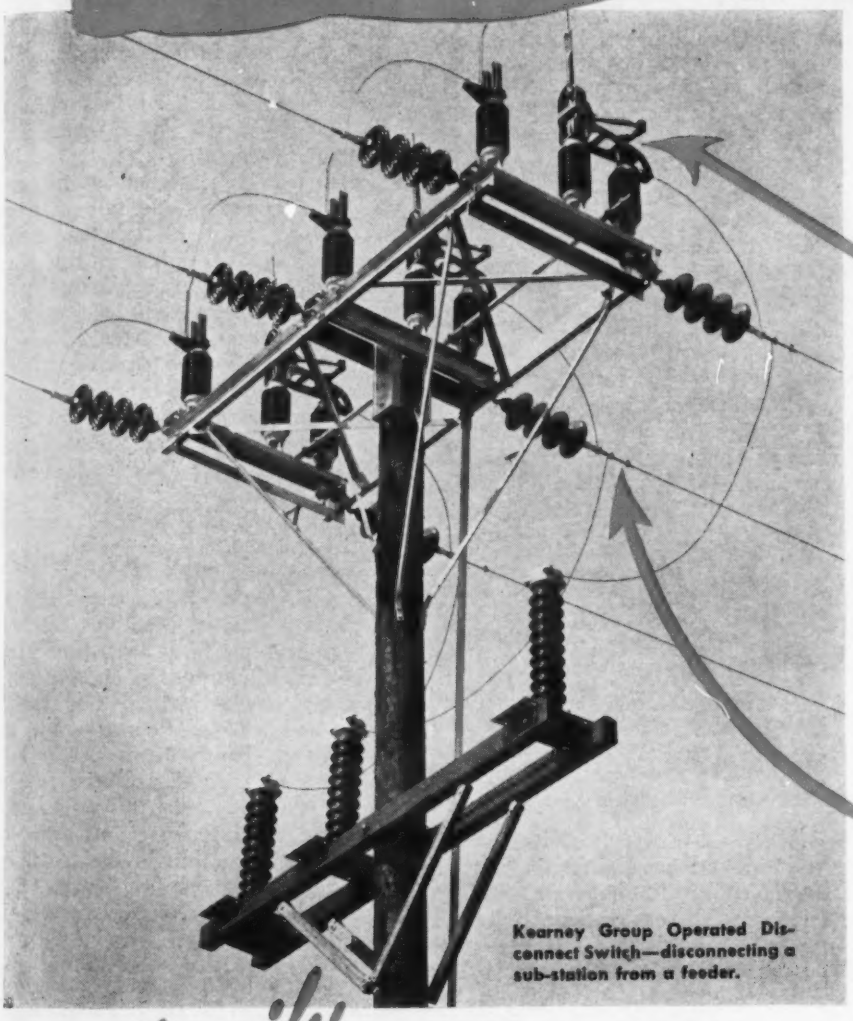
Labor took the floor in the persons of Arthur Edwards, Oklahoma City, Okla., and Herb Jones, Denver, both international representatives of IBEW, who officially represented W. L. Ingram and Harry Bell, international IBEW vice-presidents. Their theme stressed harmonizing IBEW policies with those of NECA for the betterment of industry and benefit to industrial relations.

The many-phased responsibilities of electrical leagues were described by Meryl Mentzer, Rocky Mountain Electrical League's assistant manager. Services to, and coordination with, all factors in the electrical industry cover a field so broad that every branch is embraced, including manufacturer, jobber, dealer, utility and contractor. He named adequate wiring as the key to public understanding of permanent, safe and satisfactory electrical service.

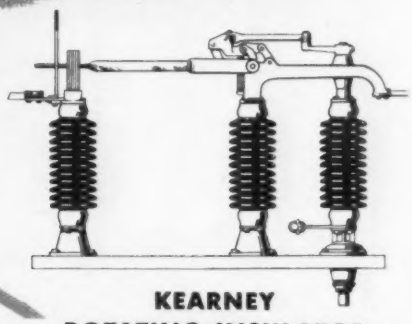
Charles Sholibo, manager of the Southwest Texas NECA Chapter, also emphasized the importance of installing approved materials and pointed to the program of contractors in his area, utilizing billboards to advertise guaranteed wiring.

Functions of an NECA chapter are best fostered through the printed word, Lawrence Martin, manager of the Northeast Texas NECA Chapter, believes. He proposed an area-wide publication as a means of cementing and enhancing good will between contractors and their customers. In this connection, he issued the warning that too independent an attitude on the part of contractors toward present and

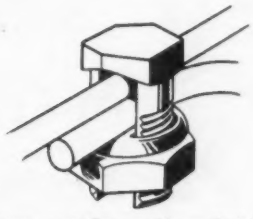
KEARNEY ROTATING INSULATOR SWITCHES Assure Easy Trouble-free Operation



Kearney Group Operated Disconnect Switch—disconnecting a sub-station from a feeder.



KEARNEY ROTATING INSULATOR GROUP OPERATED SWITCHES are easy to operate because all contact friction is eliminated during blade travel, and because ball bearings are used in the insulator bearing. They have high ice breaking ability. Current carrying parts have adequate capacity including a large safety factor.



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Provide permanent, positive electrical connection. "Hex" heads, sturdy construction, uniform threads, weather resistant material and other design features make this one of the most popular solderless connectors. They are fast and easy to use—linemen like them and they save time, reduce costs. Available for all combinations of metallic conductors.

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THE NEW McGILL *Vaporproof*

Portable Lamp Guard . . . strong, portable, sealed. It is water-tight, vapor-tight, dust-tight and moisture proof. The plastic handle, and fibre cage are shock proof and non-sparking. **A rubber gasket has now been placed between the cage and handle, and absorbs all stress and strain, preventing breakage.** The heavy glass protecting globe eliminates possibility of breakage of the lamp bulb inside from splashing liquids. Being air-tight these guards are perfectly safe for use where vapor and dust infused air is prevalent. They have no equal for safety, service and convenience around flour mills, paint booths, finishing rooms, airports, warehouses, food processing plants, shipyards, aboard ships, and many other places.

The No. 3007 has the plastic cage. The No. 3006 has a heavily tinned, electrically welded wire cage.

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prospective customers will have later repercussions; that now is the time to build a foundation for future business.

George Roscoe, public relations director of the NECA, dealt with advertising problems of the contractor. He said that headquarters of the organization is now in position to provide advertising service at low cost to members.

George A. Seaman, NECA's field supervisor at Fort Worth, Tex., addressed the convention on Building Better Public Relations; and Paul M. Geary of Washington, D. C., executive vice-president, closed the three-day session with a prediction that unless contractors perpetuate relationships with labor, there eventually will be no more electrical contractors.

A chuck wagon dinner (symbolic of the West, substituting for the usual climactic banquet) was served to delegates in the Garden of the Gods, where IBEW Local 113 and the Colorado Springs Contractors' Assn. were joint hosts.

Attending from Division Six of the West Coast, were T. L. Rosenberg, Oakland, vice-president of the division; Grover Burke, governor, R. B. Lane, president, and Russ Horning, manager of the Seattle Chapter; and A. R. Johnson, governor of the Portland Chapter; and A. E. Martin, field representative, Division Six.

● WITH INSTALLATION of its new officers, the Southern California Section, Illuminating Engineering Society, opened the fall season Sept. 4 in Los Angeles with a talk from Deputy Chief W. J. Bradley, chief of detectives, Los Angeles Police Dept., who spoke on the effect of good lighting upon juvenile delinquency. Barney Luley, Westinghouse Electric Corp., was installed as the new chairman of the section, succeeding Charles D. Gibson, State Department of Education. The Oct. 16 meeting will be a joint one with the Electrical Maintenance Engineers Assn. at Scully's Cafe. There will be three speakers, Ted Rand, Charles Goddard and Guy Morse.

● SOMETHING of a "foreign exchange" was conducted for the opening meeting of the British Columbia Chapter, Illuminating Engineering Society, Sept. 12, at Canadian Forestry Assn. auditorium, Vancouver, B. C., when Chairman B. T. Heinz, of Washington State Chapter, IES, was the guest speaker. His subject was The Use of Combined Fluorescent and Filament Sources in Modern Store Lighting. Eric E. Ackland is chairman of the British Columbia Chapter, which made the outstanding record during the past year for increase in membership, winning the IES president's award.

Seattle Electric Club

Tom Widrig, manager of sales for the Northwest district of the Trumbull Electric Mfg. Co., has been named president of the Electric Club of Washington, succeeding O. A. "Chick" Alderman of the McGraw Electric Co., who served during the 1945-46 club year. He was inducted into office at the Sept. 16 meeting held in the Frye Hotel in Seattle.

Other officers installed at this session, the second of the fall meetings, included: John P. Lawton, newly named Graybar head in Seattle, first vice-president; Claude Kingsbury, Ohio Brass Co., second vice-president; Charley Allison, Puget Sound Power & Light Co., renamed treasurer, and Dick Church, Puget Sound Power & Light Co., renamed secretary.

Trustees chosen were: Bev Travis, electrical engineer; William S. Gaunt, business manager and financial secretary, Local 46, IBEW, and Frank Holert Jr., Holert Electric Service.

The Electric Club of Washington has a membership of 196, including 13 honorary members. Meetings are held in Seattle on the first and third Mondays of each month at noon. Outstanding social events include the Thanksgiving and Christmas parties and the Annual Golf Tournament, usually held the latter part of May or the first of June.

Widrig, during the many years he has held membership in the organization, has been secretary, trustee, program and membership chairman.

IES Regional Meetings

Coordination of plans for three regional conferences of the Illuminating Engineering Society on the West Coast is being effected between the two regional vice-presidents, their successors, the chairmen of the chapters and sections. IES President Gilbert Hardacre has promised to attend the meetings and tentative dates set are as follows: For the Northwest, Seattle, Nov. 14-15; in San Francisco for the northern California area, Nov. 18; in Los Angeles for the southern California area, Nov. 21.

Effort is to be made likewise to get several of the other speakers at the Quebec convention of IES to make the trip at the same time Hardacre does, so that they can present summaries of the various sessions at that convention. Chapter officers and section officers are heading committees handling the arrangements in each locality. W. A. Cyr, ELECTRICAL WEST, has been asked to act as coordinator between the three conferences.

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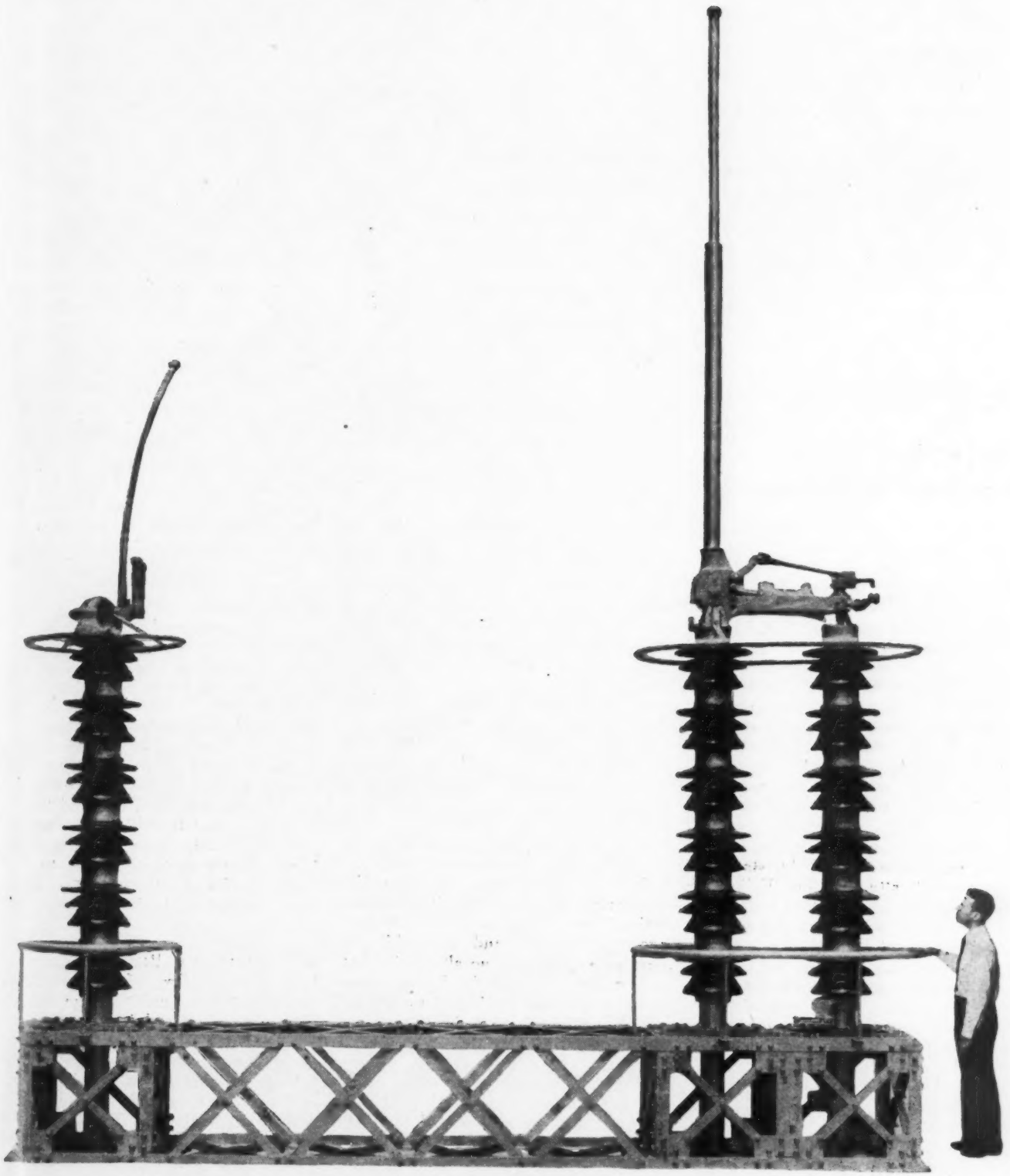

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NEWS of the industry

STATE-WIDE COMMITTEE PROMOTING INITIATIVE

A state-wide committee to promote passage of Initiative 166 has been formed in Washington, with Robert J. Lloyd, Tacoma business man, as chairman and George E. Thomas, Bremerton newspaper man, as executive secretary. Initiative 166 calls for a vote of the people before PUD commissioners can issue bonds for acquisition of power properties.

The Washington press last month carried advertisements pro and con. A series opposing the initiative appeared over the signature of Frank McLaughlin, president of Puget Sound Power & Light Co. Committee for Initiative 166 supplemented its ads in Seattle papers with front-page banners running in color and calling attention to the inside page. One of these banners ran: "Protect your right to vote on how your money is spent. Vote for Initiative 166. See Page 8."

Court Studying Briefs in Puget Power Purchase Plan

Legality of the PUD plan to purchase Puget Sound Power & Light Co. was taken under advisement by the Washington State Supreme Court, following a three-hour hearing on Sept. 4. More than 800 pages of printed briefs were submitted.

In an earlier decision, Skagit County Superior Court held that Skagit PUD could issue $135,000,000 in revenue bonds to finance the purchases and that John Wylie, secretary of the Skagit PUD, should sign and certify the bonds. Wylie appealed the case and was joined by the Weyerhaeuser Timber Co., which maintained that the transaction was not legally authorized.

In arguments before the state supreme court, attorneys for Wylie and Weyerhaeuser asserted that the major portion of the power company properties are situated outside Skagit County, and that the law does not provide for such vast operations outside a district's boundaries. They contended the proposed transaction would enable Skagit PUD to control the systems in organized counties and in the larger unorganized counties of Pierce and King, regardless of the will of the people of those counties.

They also attacked what they termed the illegal method of financing the $135,000,000 transaction, saying one county or PUD cannot lend its credit to another, as Skagit proposed to do in acting as agent for the other districts.

Attorneys for the city of Seattle, joining the opposition, said the people of that city would have no voice on operation of the system within the city by the Skagit PUD.

Attorneys for the Skagit PUD argued that the law repeatedly says a PUD may operate "within or without" its boundaries.

Debate Hot in Ouster of Public Power Officials

Because of their activity in the Socialist party, two members of the Washington Public Utility Commissioners Assn. were asked to resign last month. Thomas L. Scanlon Jr., clerk in the Seattle office and candidate on the Socialist ticket for state senator, refused to resign, but Bernard L. Pierce, research director for the association and Scanlon's campaign manager, submitted his resignation.

Pierce, who for years has been one of the leaders in the public power movement in Washington state, said he tendered his resignation in view of statements by commissioners that his participation in the Socialist party would endanger the association's fight against Initiative 166. The initiative, which would call for a vote of the people on bond issues instead of leaving such matters to the discretion of PUD commissioners, will be on the November ballot.

The Rev. Fred W. Shorter of Seattle, state chairman of the Socialist party, warned the association by letter that retaliatory action could be expected against individual commissioners if they persisted in their ouster of Pierce and Scanlon.

The Socialist party "considers the action by your association a gross violation of civil liberties," the Rev. Mr. Shorter wrote. "Since the PUD organization was set up as a non-partisan agency, Socialists and the public in general are left with no alternative but to conclude that the forcing of these resignations was motivated purely by selfish partisanism of Democrats in your organization."

● FOURTH REPORT of operations under the Boulder Canyon Project Adjustment Act, for year ended May 31, 1945, is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 10c a copy.

BPA TO MARKET FEDERAL POWER IN SOUTHERN IDAHO

Bonneville Power Administration has been instructed to assume responsibility for power marketing of federally generated electricity in southern Idaho and to include in its 1948 budget estimates of funds required for survey of transmission lines, market studies and development work in that area, it was announced last month by Girard Davidson, assistant secretary of the Interior.

Davidson, who was in Boise for a visit with department representatives, said that Secretary Krug had asked Bonneville Power Administrator Paul J. Raver to apply the principle of a uniform power rate throughout its marketing area, including the Snake River basin.

Interior previously had asked the Bureau of Reclamation and Bonneville to make a joint study of the southern Idaho situation, Davidson said, and it was believed that most effective development would result from giving Bonneville responsibility for power transmission and sales and USBR for irrigation development. Both agencies will work together in planning construction of dams and power plants, he said.

Development of Idaho phosphates and other resources will be one phase of the program.

"I am impressed with the forecast made by the department's staff that power use in the Snake basin will increase several times over during the next 20 years," Davidson said. "The Bureau of Reclamation is prepared to construct dams and power plants within the next ten years to utilize local resources. The Bonneville Power Administration has been directed to proceed immediately with planning surveys and construction of transmission lines connecting these plants to load centers and also interconnecting Idaho with the Columbia River power system."

● PERMANENT REORGANIZATION in Union County, Ore., of a citizens' association for home rule and the right to vote was announced in the press last month. Ralph G. Chenault is president of the association, which will center activity on keeping informed on plans of the Union County PUD and on federal power activities. The group was active in the controversy involving PUD acquisition of the former Eastern Oregon Light & Power Co. properties from California-Pacific.

IT'S Copperweld-copper

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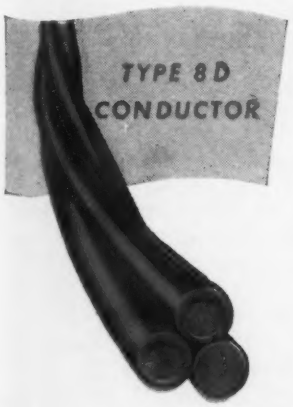

For extra rugged lines of No. 8 conductivity use Type 8D. It is an extremely strong conductor consisting of two Copperweld wires and one copper wire.

COPPERWELD'S unique Molten-Welding Process gives to a strong alloy steel core a heavy, protective covering of copper *permanently welded* to the steel. We strand this rugged Copperweld wire with copper wire into a triangular design which minimizes vibration and it becomes the time-tested, non-rusting Copperweld-Copper Conductor. Ideal for long-span construction, safe under heavy wind and ice loading, Copperweld-Copper is a dependable performer insuring lowest annual cost.

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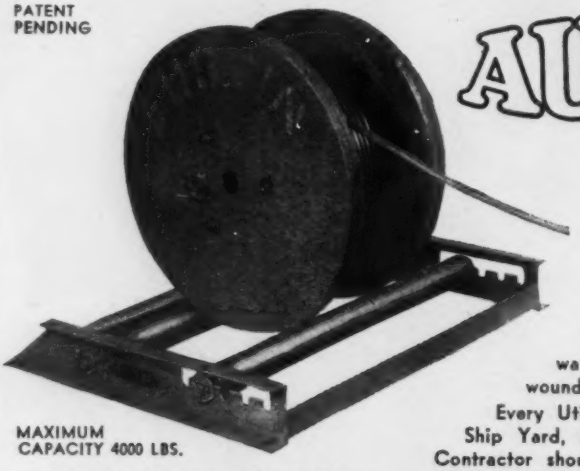

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A new quick, easy, safe way to dispense any material wound on a reel.

Every Utility, R. E. A. Cooperative, Ship Yard, Railroad, Wholesaler and Contractor should have several AUSTIN REEL ROLLERS. When pulling one or more cables into conduit use an AUSTIN REEL ROLLER for each cable. Can be mounted stationary or used on the job as a portable device—ideal for service and repair trucks.

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(6) Heavy steel frame, painted bright orange, not only adds to its appearance, but, also, makes it readily visible on the floor which helps to eliminate accidents.
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(8) Will take any reel up to 30" in width. For larger reels, use two reel rollers and bolt together end to end.
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We're doing our best to get them out.

After the fire on March fifteenth, there was a lot to do—wreckage to clear away, decisions to make, a future to plan. One of the big factors that helped to make our decisions and shape our plans, was knowing that you were depending on us for Gardner Transformers.

Well, we've gone quite a way in the months since March. Three units of the new plant are completed and in use. Other units are on the way up.

And one thing about the new plant—we decided to do it right this time, and so the new Gardner Electric layout is the product of the best thinking of all of us . . . plus the ideas of the best construction engineers we could get to help.

That's one reason why Gardner Transformers are going to be better than ever. And for another, we are putting our best into them so that you'll know, it's been worthwhile to wait.

Dave Taylor

DAVID G. TAYLOR,
Vice-President and
Sales Manager

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EMERYVILLE, 8, CALIFORNIA

FARMERS WIN POINT ON POWER LINE LOCATION

Butte and Yuba county (Calif.) farmers won their point on location of the ten-mile Oroville-Sacramento section of the USBR's line from Shasta Dam, (EWEST, September, p. 122)

The Bureau of Reclamation announced in Sacramento last month that it would accept the recommendation of a Palermo-Honcut district landowners committee that the proposed routing of the line be moved one mile east. The new route crosses grazing and pasture land, by-passing irrigated farming lands.

Farmers had protested the bureau's choice of a route, claiming the line would interfere with activities such as crop dusting by airplane, planting and land tilling. Bureau spokesmen had contended that the original route was the most economical and feasible course, meeting the problems "as well as it can and still be satisfactory from an engineering point of view."

In the course of the discussion, the Palermo-Honcut committee asked the Mead War Profits Investigating Committee to examine the Shasta-Sacramento transmission line project. In a telegram to Senator Mead, the group accused the bureau of "wasting millions of dollars" on the line, which it maintains will duplicate existing transmission facilities.

PUD Going Ahead with Northwestern Purchase

Cowlitz County (Wash.) PUD last month announced that it would go ahead with acquisition of Northwestern Electric Co. properties under terms of a condemnation jury verdict, awarding the company $493,215 (EWEST, September, p. 114). The PUD has sold an $813,000 revenue bond issue to John Nuveen & Co., Chicago, and will use balance of the money for system improvements. The PUD budget also lists a possible expense of $1,750,000 in the event it buys Puget Sound Power & Light Co. holdings in Cowlitz County.

B. C. Power Commission Contesting Valuations

B. C. Power Commission is appealing valuation set by American Appraisal Co. of Milwaukee on three hydroelectric systems taken over when the government body was formed. The properties were owned by the Nanaimo-Duncan Utilities Ltd., the West Canadian Hydro Electric Corp. Ltd. and the Columbia Power Co. Ltd.

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With this Chance Hot Line Tool Trailer, maintenance crews have the tools they need — right on the job — dry, safe, and ready for use. This trailer is patterned after the latest model used by our Tips Tool Demonstration men who suggested many of its special features. It greatly simplifies storing, transporting, and handling hot line tools, increases maintenance crew efficiency and safety and cuts maintenance costs.

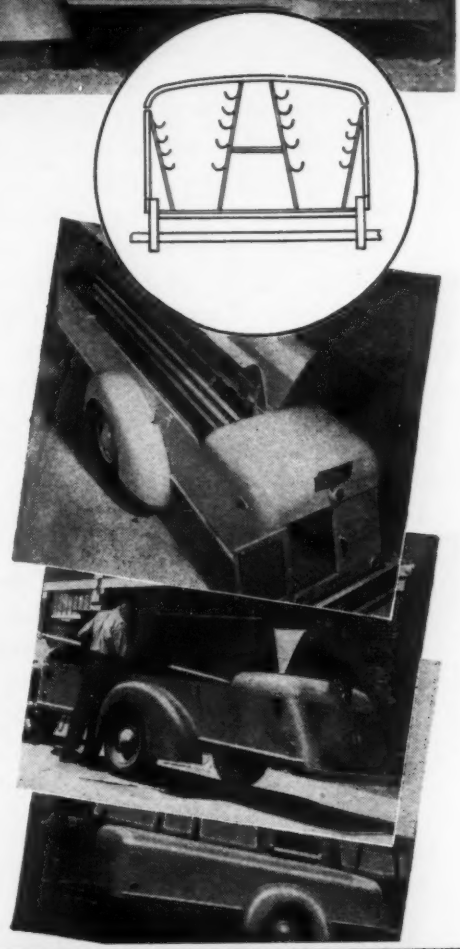
The trailer can be supplied with a complete set of tools for handling all types of hot line maintenance work or to accommodate your present equipment. It is furnished with a heater which may be plugged in when the trailer is not in the field and keeps tools dry and safe.

Check these Features: Non-mechanical, easy-to-open, waterproof top panels make tools readily accessible from both sides and automatically latch safely when in raised position. When closed, the panels can be securely locked. Double rear doors with lock-type handles provide additional accessibility to tools. Sponge rubber gaskets on all panels give snug refrigerator-door fit. Padded hooks provide convenient support to keep tools off the ground when not in use.

Trailer is built on low chassis making tools easy to reach. Low center of gravity adds to carrying safety.

Streamlined design, with wheels near center gives perfect load distribution and takes strain off towing vehicle.

Tow bars, brakes, and color to meet your requirements. Write for complete information, specifications and prices.



C4612

abc INDUSTRIES

A·B·CHANCE CO·

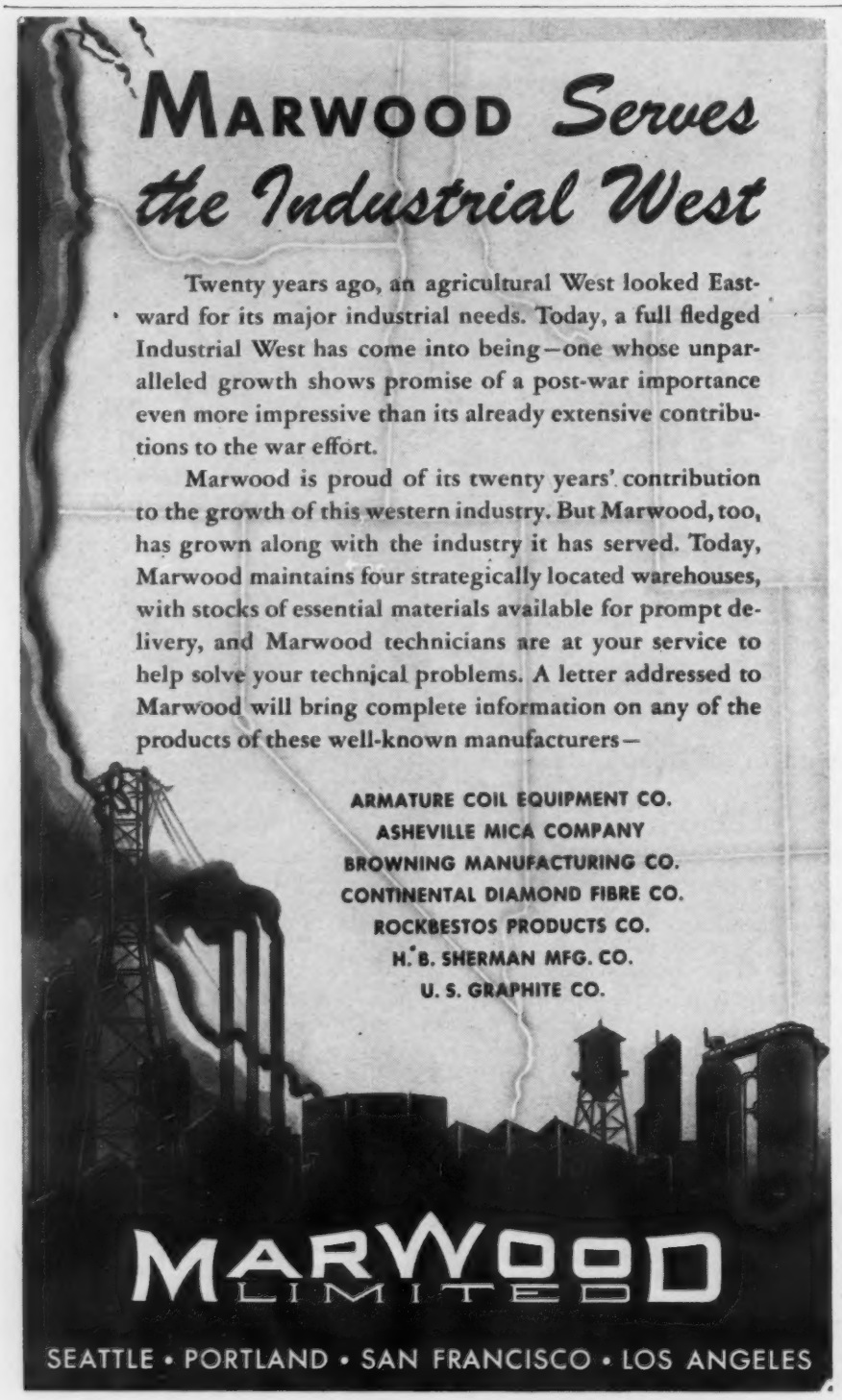
CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

TUCSON PURCHASE APPROVED BY ARIZONA COMMISSION

Purchase by the Tucson Gas, Electric Light and Power Co. of electric distribution and service lines owned by the Stonewall Electric Co. in the vicinity of Tucson, Ariz., has been approved by the Arizona Corporation Commission. The facilities for years have been used by the Tucson utility under lease agreement and are an integral part of its distribution system. Purchase price was $65,355.

● Okanogan County PUD No. 1 at Okanogan, Wash., has received a bid of $192,200 from the Bonneville Power Administration for its 115,000-volt Brewster-Okanogan transmission line and substation facilities at Brewster and Okanogan, A. L. King, PUD secretary, reported. The proposed sale is on the ballot for the Nov. 5 general election.

● Bids for construction of a control house and switchgear room at Longview, Wash., have been called by Bonneville Power Administration for opening Oct. 16. No bids were received on the original call for bids, which were to have been opened on June 5.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Twenty years ago, an agricultural West looked Eastward for its major industrial needs. Today, a full fledged Industrial West has come into being—one whose unparalleled growth shows promise of a post-war importance even more impressive than its already extensive contributions to the war effort.
Marwood is proud of its twenty years' contribution to the growth of this western industry. But Marwood, too, has grown along with the industry it has served. Today, Marwood maintains four strategically located warehouses, with stocks of essential materials available for prompt delivery, and Marwood technicians are at your service to help solve your technical problems. A letter addressed to Marwood will bring complete information on any of the products of these well-known manufacturers—
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CONTINENTAL DIAMOND FIBRE CO.
ROCKBESTOS PRODUCTS CO.
H. B. SHERMAN MFG. CO.
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MARWOOD LIMITED
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NORTHWEST ALUMINUM LOAD NEARING WARTIME PEAK

Under terms of a ten-year contract signed Sept. 17, Reynolds Metals Co. will receive a block of 140,000 kw. of Columbia River power at its Troutdale, Ore. aluminum pig plant, it was announced by the Bonneville Administration.

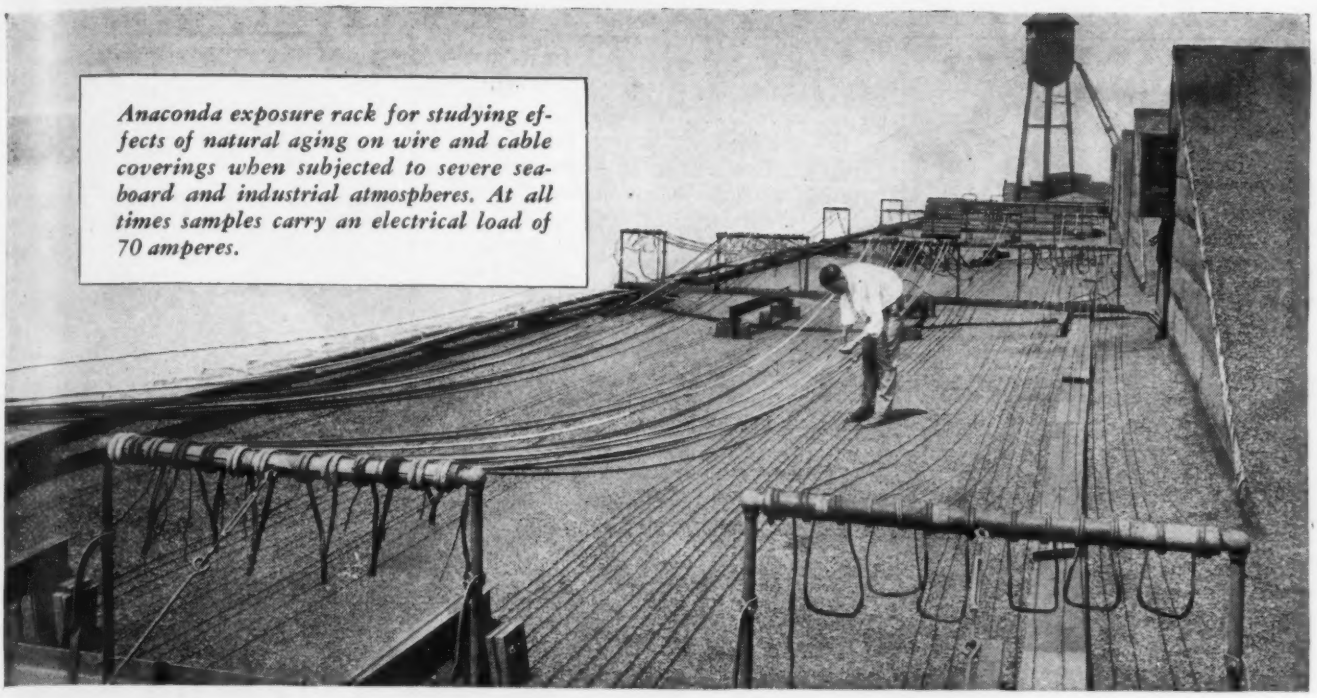
Resumption of operations at the plant leaves but one of the Pacific Northwest's war-borne aluminum plants idle and brings to 623,000 kw. the committed aluminum power load of the administration as compared with 686,300-kw. peak deliveries during wartime. The idle plant is expected back in operation within a short time.

In connection with the announcement, William A. Dittmer, Bonneville power manager, said that resumption of operations at Troutdale and continuing larger amounts of power absorbed by other plants and customers, will utilize virtually all surplus power available in the Northwest, making it mandatory that additional generators be installed at Grand Coulee as rapidly as possible. Equally critical are present serious overloads on the Bonneville transmission system, he said.

"On Sept. 12 the requirements to serve administration customers reached a new postwar peak of 1,144,000 kw. compared with 1,427,000 kw. during the peak of war production. An additional 32,500 kw. began coming on at the Kaiser plant in Spokane this week (week of Sept. 16) and with the new load at Troutdale it becomes increasingly apparent that we have reached a critical period in our power supply in this region," Dittmer said. "Removal of the two 75,000-kw. generators from Grand Coulee plant to their permanent location in the Shasta Dam power house has cut the installed capacity at Bonneville and Grand Coulee plants from 1,326,400 kw. to 1,176,400 kw. and has limited the peaking capability at the two plants, under the most favorable conditions, to 1,300,000 kw.

● Pacific County PUD received no bids for construction of a $50,000 administration building at Raymond, Wash., before the scheduled opening date in August but will call for new figures, Manager R. D. O'Neil reported. The one-story, masonry structure will be 60x95 ft., will have a reinforced concrete floor on pile foundation, electric heaters with air conditioning units.

● Shelton County (Wash.) PUD has secured allocation of $63,000 from REA funds for construction of 37 miles of electric service lines for the Eldon-Brinnon-Walker Mountain area in Mason County.

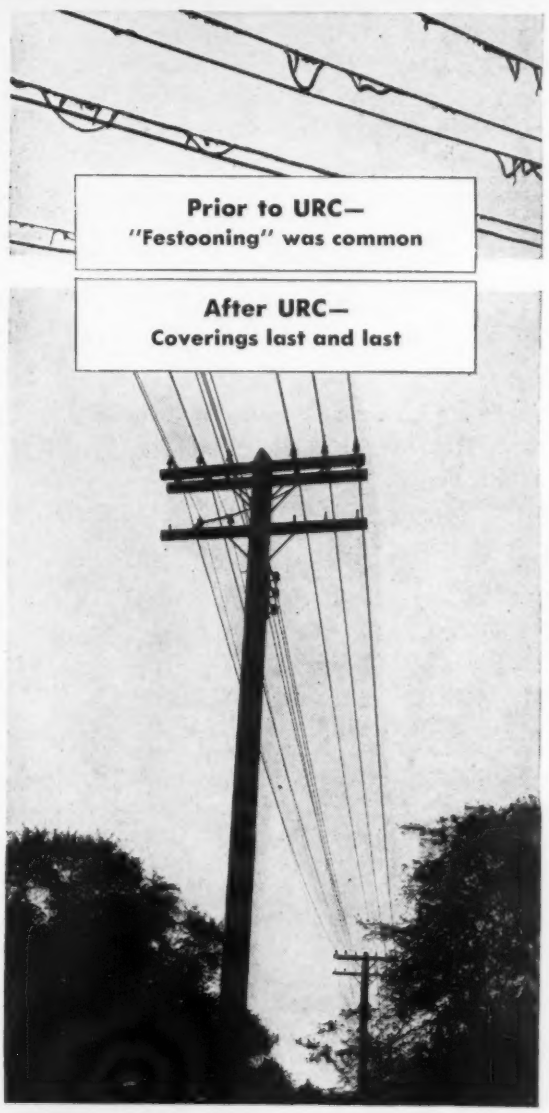


Anaconda exposure rack for studying effects of natural aging on wire and cable coverings when subjected to severe seaboard and industrial atmospheres. At all times samples carry an electrical load of 70 amperes.

Rigid tests prove URC Weatherproof lasts and lasts...

Besides the severe tests applied to the components of Anaconda Weatherproof, the finished wire and cable is subjected to long natural aging tests as shown in the accompanying pictures. These exposures are supplemented by laboratory accelerated aging tests. Both types indicate a trouble-free service capacity for years and years.

46294



ANACONDA

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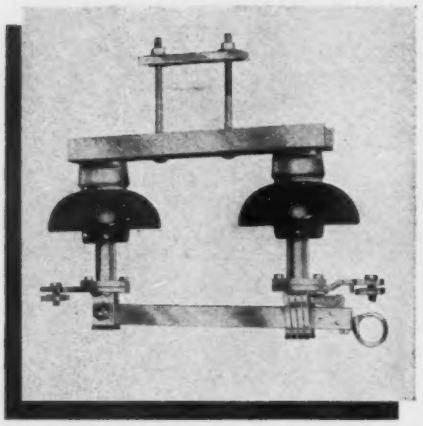
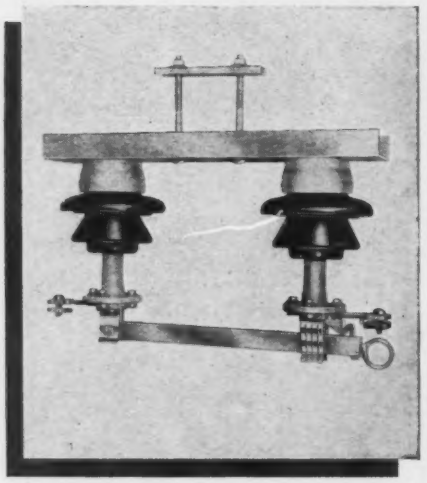
LOOK TO Anaconda FOR WEATHERPROOF THAT LASTS!

MATTHEWS
DISCONNECTING
SWITCHES



Available in ratings of 7.5, 15 and 23 KV., 200 and 400 amperes. These hook operated switches are well constructed and have large blades and positive contacts which prevents any overheating at full rated load. All 200 ampere rated switches are furnished with single blades while the 400 ampere switches have double blades and can be supplied with or without blade latches. They are adaptable for horizontal or vertical mounting and can also be supplied with NEMA rated insulators as shown below.



Write for Bulletin 106

W. N. MATTHEWS CORP.
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SALVAGE SUPPLEMENTING ELECTRIC FACILITIES

To supplement power facilities at Eureka, Calif., until a permanent installation can be completed, Pacific Gas and Electric Co. will use salvage wreckage from a tanker that split in two in the Aleutians. PG and E was low bidder for the stern portion of the tanker, *Donbass III*, offering $125,000 for the 4,000-kw. boilers and generators. The company plans to tow the section from Seattle to Eureka, where it will be moored in a waterfront slip. A short transmission line will carry energy to consumers.

Power demands have increased sharply at Eureka due to a growing lumber industry. Increased capacity for the steam plant there and a new transmission line are underway. The transmission line, a 110-kv. circuit to cost $2,237,500, will stretch from Anderson to Freshwater, Calif., 110 miles, and a switching station will be built at Freshwater. The territory is served at present by a 60-kv. line. At the steam plant, capacity will be increased 40%, from 12,500 to 17,500 kw., at a cost of $500,000.

Public Service Co. Begins Repair Job At Barker Dam

A 4x6-ft. tunnel, 120 ft. long, has been driven by Public Service Co. of Colorado to drain Barker reservoir, near Boulder, Colo., into Boulder Creek, preliminary to resurfacing the upstream side of the dam. Built 36 years ago to impound water for operation of the company's hydro plant on Boulder Creek, the big lake—described by the press as "fourteen stories high"—has never before been emptied.

The rehabilitation job will involve cementing 1,000 mammoth concrete slabs to the face of the dam at a cost estimated at $66,500. Raymond F. Davis, consulting engineer of Berkeley, Calif., has charge of designing and technical direction. Formula for the operation was developed by the U. S. Reclamation Service.

● To Avoid burning coal and oil in Oregon and Utah steam plants, three Northwest power companies have signed a short-term agreement with Bonneville for large blocks of firm and dump power. The three companies, Washington Water Power, Northwestern Electric and Pacific Power & Light, will take upwards of 50,000 kw. during the contract period, Aug. 9 through Dec. 31. The contract has a limitation and cancellation clause and provides that Washington Water Power shall deliver power to certain PUDs and co-ops.

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BY

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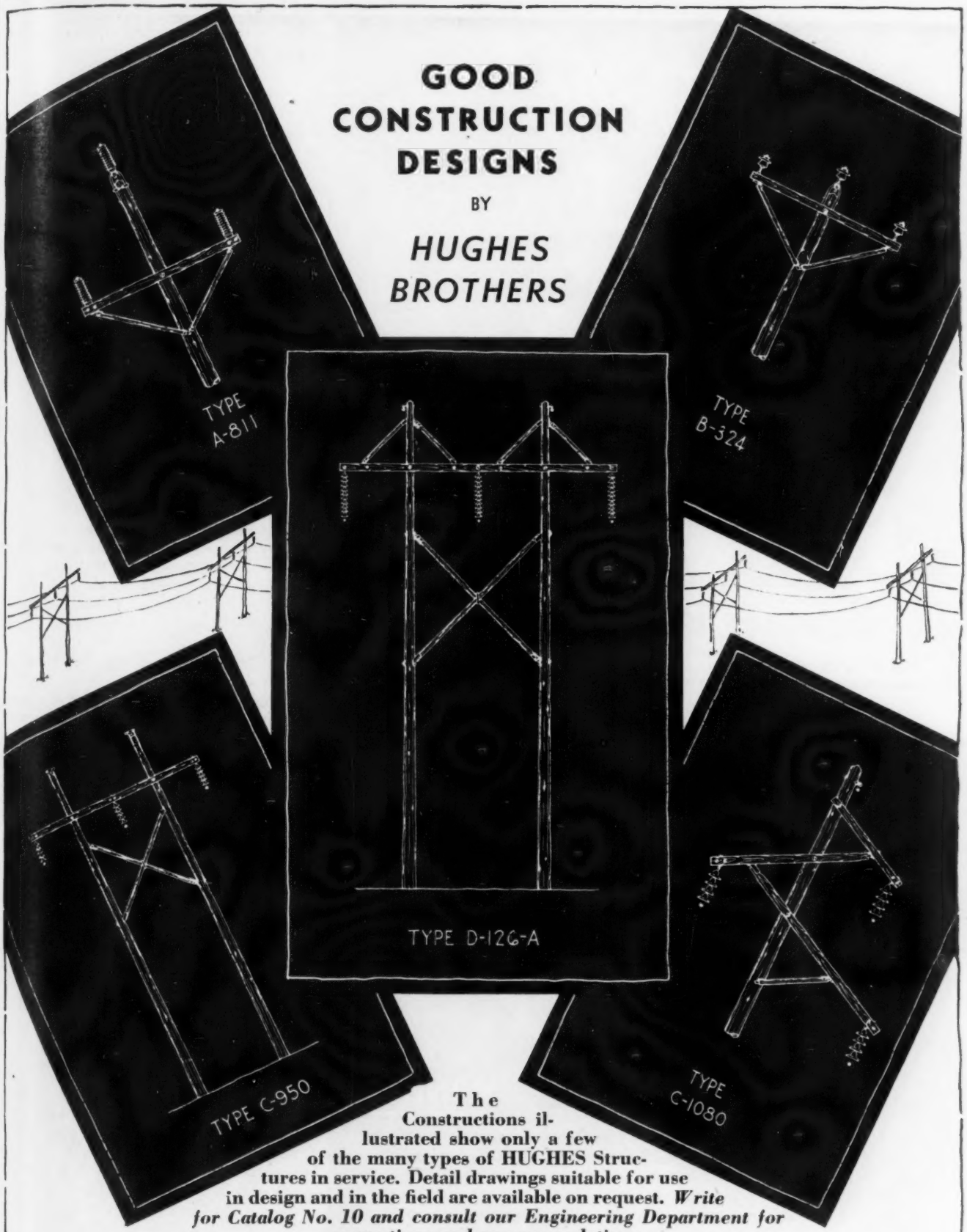

The Constructions illustrated show only a few of the many types of HUGHES Structures in service. Detail drawings suitable for use in design and in the field are available on request. ***Write for Catalog No. 10 and consult our Engineering Department for suggestions and recommendations.***

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HEROIC MEASURES SAVE COLORADO FARM CROP

Citizens of the San Luis Valley in southern Colorado and the Public Service Co. of Colorado, with the backing of the U. S. Navy, joined in a 30-day rescue mission that saved $8,000,000 crop of potatoes and other produce from drouth destruction.

When drouth conditions caused unprecedented irrigation pumping demand, dangerously overloading its facilities, the utility secured one of the Navy's 600-kw. mobile wartime electric generators on a lend-lease basis. In addition, the company brought into use and coaxed thousands of kilowatts from an obsolete and long-idle steam plant at Salida, 87 miles from the endangered crop area. Crews worked overtime—time and a half and double-time—to keep the district's 320 pumps going.

The people of Alamosa, capital of the San Luis Valley agricultural district, and adjacent communities, voluntarily adopted a conservation program, including a month of "wattless" days and embracing cold meals, semi-darkened stores, dimmed homes, blacked-out streets and short supplies of hot water.

On the journey of the mobile power plant to Colorado, the Navy, railroad officials and others cooperated to surmount such difficulties as a train wreck and a railroad traffic jam.

Public Service Co. of Colorado had ordered equipment to enlarge its Alamosa plant before the drouth threat occurred, but material shortages had delayed delivery. The new facilities, which will almost double the plant capacity, will be delivered next spring.

● NORTHWESTERN ELECTRIC Co. crews at Vancouver, Wash., are engaged in a $200,000 expansion program in that city. Work includes the extension of lines and services, 66,000-volt oil circuit breakers at the West substation and the rerouting of some existing lines.

● HARRY W. BASHORE, former Commissioner of Reclamation, has been named by President Truman as United States representative in Upper Colorado River Basin Interstate compact negotiations at Cheyenne. Appointment of a federal representative was requested by the state governors.

● COLORADO PUBLIC UTILITIES COMMISSION announced July 16 that it had approved a reduced schedule of electric rates affecting Sterling, Atwood, Hillrose, Iliff, Merino, Peetz and several unincorporated communities in Colorado. The territory is served by Public Service Co. of Colorado.

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SEND FOR NEW PRICE SHEET

1 Cable can be cut to accurate length after being sagged—eliminating waste.

2 Large clamping area grips without distorting or damaging cable.

3 Wedge design tightens grip on cable as tension increases.

4 Made entirely of non-corrosive alloys of high copper content.

5 Easy to install—does not need to be threaded.

6 Available for all popular round or oval service cable sizes.

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FOR WIRE IN THE WEST— IT'S WESTERN

BOISE REVISES CITY CODE CONFORMING WITH NEC

The Boise, Idaho, city code on electrical wiring and electrical equipment is being revised in accordance with the national code as a result of an ordinance recently passed by the city council.

Also provided for in the ordinance is the creation of a board of electrical examiners to be composed of an employee of the Idaho Power Co., two electrical contractors, one registered electrician, and the city electrical inspector.

Instead of basing permit fees on the number of outlets to be installed, a standard set of fees based on over-all cost of a project is being worked out.

City Light Installing Radio-Telephone System

Seattle City Council's utilities committee has approved a request from E. R. Hoffman, City Light superintendent, for $93,000 to install a radio-telephone system to be used by City Light in communicating with its Skagit River power projects. The system, which will require an estimated two years for completion, will replace 100 miles of telephone lines. It will require a communication building at Newhalem; radio stations at Rockport, Hazel and Bothell; radio-telephone exchanges at the Skagit projects with Seattle connections; new connections between City Light headquarters building in Seattle and its warehouses; and radio system for load dispatchers.

● SPARK AND FLAME is the name given to a cheerful and bright new employee magazine just started by Central Arizona Light & Power Co. The employees' house organ is a newspaper of five-column width and six or eight pages, edited by Al Tudor under the direction of the publicity and advertising department. A bright newspaper style is used with many contributions and photographs from various departments. The name of the paper was given by Caroline Nufer of the home service department, in a company contest.

● CITY OF DENVER, after 27 traffic fatalities in 1946, is installing traffic lights at eight intersections where accident hazards have proven to be great. Some 12 or 14 additional installations should be made, according to a survey by Robert Kirschwing, Denver's manager of safety, and Police Sergeant Shirley Sloan, but lack of materials will prevent early realization of the program.

Electrical
INSULATING
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Pardon the eavesdropping—

but did we hear MITCHELL mentioned?

HARRY: So you're getting rid of your old lighting, Tom. What kind of fluorescent are you going to install?

TOM: What kind? Why—I don't know—they're all pretty much alike, I suppose. What do you think about it, Harry?

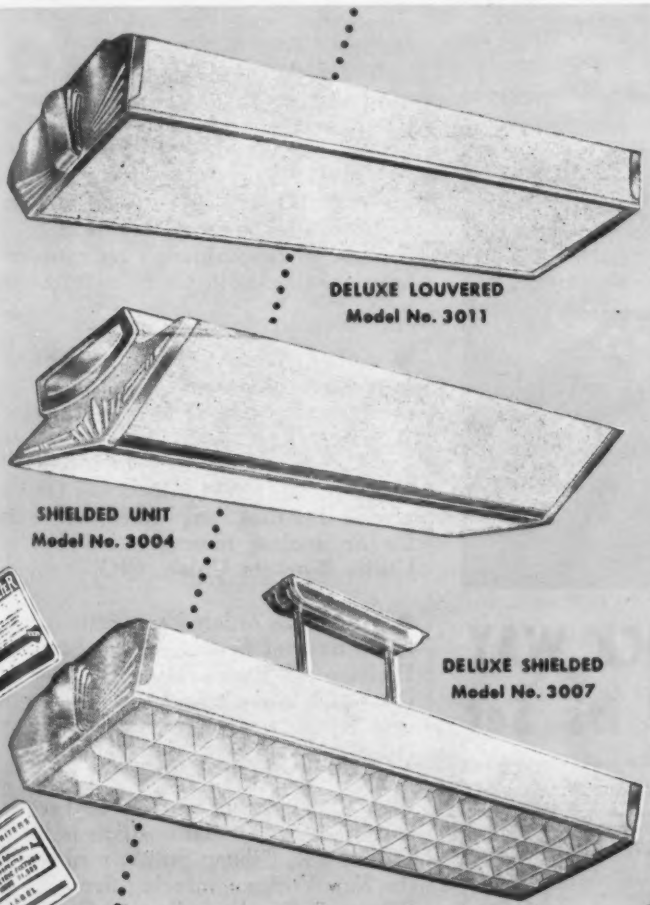
HARRY: Well, they're really not all alike. My contractor recommended MITCHELL fixtures for my place, and he really turned out a swell job. Plenty of light all over—and the fixtures went up fast, too. He claimed MITCHELL lights are "top"—and he was right.

TOM: Sounds like a good lighting tip.

HARRY: And that isn't all. The utilities man who calls on me was plenty impressed with the job—said I had as good a lighting installation as could be bought at any price.

HARRY: If I were you, Tom, I'd get the straight dope on what you need from a MITCHELL distributor.

TOM: Sounds O. K.—a recommendation like that is good enough for me. I'll look into it today. Thanks for the help.



There are thousands of prospects everywhere, ready for new lighting installations—and a big factor in sales is the word-of-mouth MITCHELL-boosting that has helped make MITCHELL the most popular fluorescent lighting line in the country. Everyone—*users, distributors, contractors, utility men*—knows and appreciates the efficiency and eye-appeal of MITCHELL Commercial Fluorescent Lighting—all are unanimous in their favorable opinion of this business-building, user-accepted line. Take a tip—MITCHELL is *your* best bet, too.

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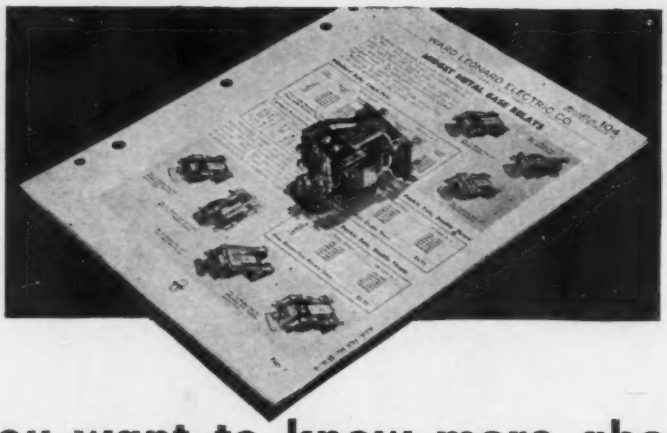

you want to know more about

BULLETIN 104 RELAYS

This group, Bulletin 104 Relays, includes standard and heavy-duty types, in a wide variety of contact arrangements, of single and double pole for front or rear mounting. They are positive in action, they are compact, they are sturdy. When designing any equipment that requires a relay function, see what Ward Leonard has to offer you. Ward Leonard Relays include types and sizes for every application. They all have crisp action, are dependable and durable yet consume but little current.

Bulletins are available describing Ward Leonard Relays, Resistors, Rheostats and Motor Controls. Send for the bulletins of interest to you.

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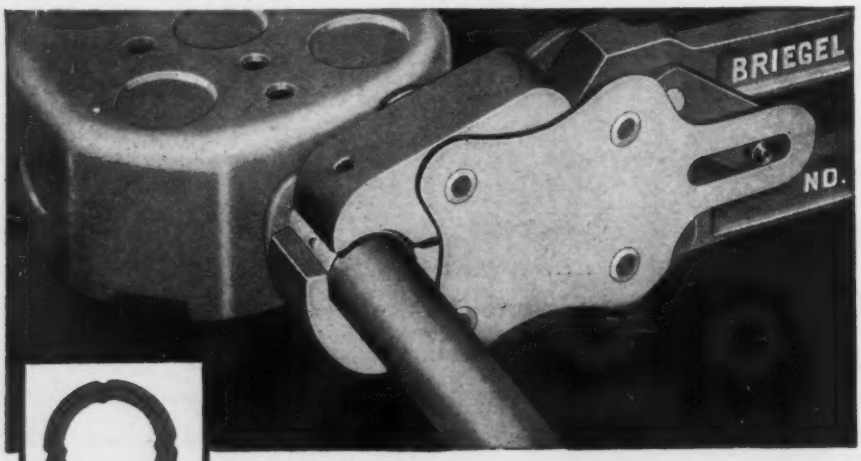

Cross section Showing Indentations.

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ENGINEER IS STUDYING SITKA HYDRO PROJECT

Sitka, Alaska, has retained Roy W. Johnson, Seattle engineer now building the Beaver Falls hydroelectric project at Ketchikan, to do the preliminary engineering for a proposed hydroelectric project at Sitka.

The project involves tapping Blue Lake as a water source and may include a 6,000-ft. tunnel, Johnson said. Sitka has not yet decided on construction work or financing of the project, but is seeking new power sources to furnish electricity to the Alaska Native Service school and hospital and other facilities on Japonski Island.

B. C. Town Signs New Agreement with IBEW

City Council representatives at Kelowna, B. C., have signed a new working agreement with the International Brotherhood of Electrical Workers, AFL. The new agreement averts a threatened mass resignation by the entire city electrical staff and calls for substantial wage increase all along the line.

Under the new set-up the foreman of the city electrical plant receives $215 per month, an increase of $50; subforeman rate has been raised from 85c to $1.00 per hour; lineman from 80c to $1.00 per hour; meterman from $125 to $155 per month. There is an increase of approximately ten cents per hour in all classifications of groundsmen.

● At the Union's Request, NLRB last month removed the name of international Brotherhood of Electric Workers, AFL, from a ballot to be voted by supervisory employees of Southern California Edison Co. On the amended ballot, employees will vote for or against representation by the Utility Workers Union, CIO.

● NLRB has ordered an election within 30 days of Sept. 5 in the Stockton Division of Pacific Gas and Electric Co. Office and clerical employees will vote for or against representation by IBEW.

● A Preliminary analysis of Tacoma City Light's financial position is being made by R. Gilman Smith, member of the New York engineering firm, W. C. Gilman & Co. According to C. A. Erdahl, utilities commissioner, the analysis will give the utility a basis on which to make an offer for a general survey. Such a survey might have a bearing on future electric schedules in Tacoma, he said.

A FREE ECONOMY IS WORTH FIGHTING FOR

BUSINESS must take the initiative if the price decontrol machinery, set up by Congress, is to be effective. The present price control law is far more than a set of instructions to the administrators of OPA; it is a challenge to business to be aggressive in speeding decontrol decisions and in persuading the Price Decontrol Board to adopt a strong stand for return to a free economy.

Thus far business has not met this challenge. *Two months after the passage of the new price law not a single application for decontrol of a major product had been filed by an industry advisory committee.* This is due in part to the red tape controlling such applications. Nonetheless, a continuation of such inactivity on the part of business can well result in perpetuating price control far beyond the time either the present law or sensible economic policy require.

It was the clear intent of Congress to hasten our return to a free economy. In the legislation continuing the general control of prices, Congress formally declared its purpose to have it "terminated as rapidly as possible."

To accomplish this, the House originally approved a formula which would have made decontrol mandatory when production had attained a prescribed level. The automatic decontrol provision was dropped before the bill was finally passed, partly because of the uncertain effects of strikes on production. But Congress did not mean to return the timing and extent of decontrol to the administrative discretion of OPA.

On the contrary, to assure having price control "terminated as rapidly as possible," Congress created a Price Decontrol Board and gave it power to overrule OPA when the board finds price control should be removed. Moreover, it gave to industry the right and the responsibility to seek decontrol. Also, in a further effort to speed up the decontrol process, it placed narrow limits on the time allowed for board decisions.

Congress had compelling economic reasons for doing its legislative best to speed up decontrol.

1. It is by all odds the best way to eliminate the bottlenecks in production and the black markets which have plagued the country since V-J Day.

Rigid price ceilings promote shortages of badly needed commodities by discouraging their production. Such shortages both upset the flow of production and promote black markets. At present a considerable part of American industry is stymied by shortage of critical parts and materials. Price control is much to blame.

2. There must be flexibility of prices if a round of new wage adjustments, which may be forced on industry early in 1947, is to be negotiated without grave risks of seriously curtailing production.

When, under the leadership of the national administration, the first post V-J Day round of wage adjustments was made, price ceilings were held rigid while wages were boosted. The result was a series of price-wage squeezes which upset production. They would have been disastrous if we had not been in a sellers' market, created by a tremendous accumulation of wartime shortages. In 1947, however, many industries will be in a buyers' market. It must be possible, therefore, to have wage increases reflected promptly in price adjustments if we are to avoid a repetition of the costly post V-J Day round of strikes, which often had price control as the key issue.

3. Rapid decontrol is necessary to maintain a high level of employment and production.

Almost five years of price control inevitably twisted the factors of production and distribution far out of the equilibrium which would prevail in a free economy to which it is the clear purpose of the nation to return. Unless the return to a free economy is facilitated by speedy and orderly decontrol, the jolt of an abrupt return to competition can be expected to upset employment and production seriously.

It's Up To Business

To encourage speed and boldness in decontrol Congress provided for the reimposition of control over any prices which, after being released, mig

get out of hand. The dangers of this sort are chronically exaggerated. During the 25-day period in July when there was no price control the Civilian Production Administration found that "manufacturers of finished industrial and consumer products have generally exhibited commendable restraint in increasing prices no more than increased costs."

All of this endeavor to speed up decontrol and expand its scope is likely to be futile, however, unless business furnishes the driving power for the machinery Congress provided. OPA certainly will not do it. Neither can the Decontrol Board be expected to go out and drum up cases.

The necessity for vigorous action by business in pressing for decontrol is increased by the fact that the general legislative standards to guide decisions by the Decontrol Board are vague. They must be clarified and sharpened by decisions in specific cases.

The main principle to guide the decontrol of non-agricultural products is that price ceilings shall be removed when supply is in approximate balance with demand. But what precisely does that mean? The meaning will become clear only through Decontrol Board decisions.

The same is true of the principle which makes automatic decontrol of a non-agricultural commodity contingent on whether or not it "is important to business costs or living costs." Business must press cases which will give specific meaning to those vague terms if decontrol is to get on apace.

Cards Are Stacked

At present the government has the cards pretty well stacked against rapid decontrol.

First, the key members of the staff of the Price Decontrol Board are holdovers from the Bowles regime which emphasized the importance of carrying on price control rather than speed in getting rid of it.

Second, in exercising his authority to prescribe regulations to govern petitions for decontrol, the OPA administrator has required excessively complicated statistical and economic data. Manufacturers who are sure they can convince any fair-minded board of the desirability of decontrolling certain of their products assert that they are blocked by statistical entanglements.

Third, OPA has discouraged business from moving immediately under one section of the law to speed decontrol. This section provides that products "not important in relation to business or living costs" may be freed from price ceilings immediately and must be freed by December 31, 1946, unles OPA specifically finds they are important to these costs. Instead of making it possible for business to move under this section now, OPA has issued rules which have the effect of blocking such a course until the end of the year.

In the light of obstacles such as these, it is not surprising that the record of decontrol to date is not impressive.

Decontrol Record

Since June 30 there has been a drop from about 70% to about 60% in the total value of products under price control. But most of the drop has been accounted for by food products, which Congress took the lead in decontrolling, and by industrial machinery which was being decontrolled when Congress acted. By far the larger part of manufactured consumer goods remains under control.

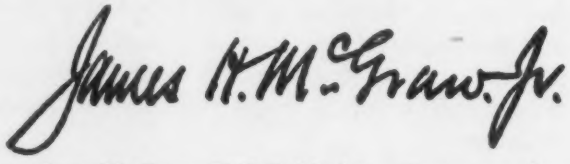
This, however, is no time for business to be discouraged. Rather, business should accept the obstacles put in its way as a challenge and work harder than ever for speedy decontrol.

The case for decontrol should not be stated in narrow technical terms. It should be based on grounds of broad public policy, and should demonstrate how a speedy return to a free economy can hasten the full release of the nation's productive power.

For example, there should be very clear demonstrations of how, in far too many cases, rigid price ceilings—(1) discourage production of key parts and materials by making such production relatively unprofitable, (2) create shortages of key parts and materials which tie up broad ranges of production or result in piling up lopsided inventories of partially completed goods, and (3) thus cut away the foundations of a stable economy and the prospects of steadily sustained employment.

There should be equally full demonstrations of the well known sequence from shortages to unrealistic price ceilings to black markets. Meat prices are rolled back, but the meat is rolled under the counter.

A free economy is worth fighting for. Liberty is preserved only by the constant struggle of those who believe in it. Neither the interests of the nation in a strong and well-balanced economy nor the interests of business itself will be served by drifting at this time. Now is the time for business to lead a strong offensive for speedy elimination of price control.



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SANDERS DECLARES FPC STATISTICS MISLEADING

Milton G. Sanders, vice-president of the Central Arizona Light & Power Co., has termed Federal Power Commission statistics on "average electricity bills" entirely misleading in the case of two-thirds of Arizona power users.

Arizona was classed among the eleven states with the highest costs in cities over 2,500 population in a recent FPC study, with the average bill for the state given as $8.10 per 250 kwh.

"Two thirds of the state's population pays far less than the average cited by the FPC," he stated. "As a matter of fact, the cost of 250 kwh. in Phoenix and other communities served by the Central Arizona Light & Power Co. is $6.52, which is 20% lower than the figure quoted by the FPC for Arizona, and 8% lower than the national average." The national average was quoted as $7.04 for 250 kwh.

"The statistics . . . include only communities of 2,500 population and over," he pointed out. "Arizona has but 20 communities of this size, and it would be just as ridiculous to add up the altitudes of these communities, divide by 20 and give a figure supposed to be the average altitude for an average Arizona town as to average the low electric costs in some communities with the justifiably higher electric costs in smaller, isolated communities," Sanders declared.

New Rate Schedules for Portland Electric Users

New rate schedules benefiting residential and commercial users have been announced by Portland General Electric and Northwestern Electric companies. Savings, based on 1946 consumption, will amount to approximately $345,000 for PGE and $160,000 for Northwestern customers.

The reduction brings total cuts in the last 12 months to $1,680,000 annually.

The new schedules will mean an approximate saving of 5% on bills for 100 kwh. for city residential users and 5 to 8% for farm users. Commercial rates will be cut an average of 5%. The new residential rates will be: first 50 kwh. per month, 3.3 cents; next 75 kwh., 2.4 cents; next 100 kwh., 1.5 cents; next 900 kwh., .08 cents, and in excess, 1 cent.

● CITIZENS Utility Power Co., Wallace, Idaho, has filed with the Idaho Public Utilities Commission reduced commercial rate schedules, which are expected to save consumers more than $7,000 per year.

PORTLAND GENERAL ELECTRIC PAYS HIGHER FRANCHISE FEE

The raising of Portland General Electric's franchise fee in Salem, Ore., from 2 to 3% of gross earnings has been approved by the city council. The ordinance will give the city about $10,000 per year additional revenue.

According to council spokesman, the increase was granted virtually at the request of PGE officials, who wished to make uniform the rates paid in all cities in the company's system. A franchise, written in the 1870s, has been in effect in Salem until the present time.

Alderman David O'Hara suggested that the increased revenue be used to improve the city's lighting system. W. M. Hamilton, division manager for PGE, gave the council a report on a program authorized several months ago to improve street lighting. This called for the replacement of 2,500-lumen lamps with 6,000-lumen. Hamilton's report showed that 57% of the work had been completed and he told the council that shortages of men and material had hindered the program's progress.

Public Service Given Ten-Year Franchise

Sterling, Colo., city council has approved an ordinance awarding Public Service Co. of Colorado a ten-year franchise. The award followed 16 months of negotiations during which the community voted upon, and rejected, a municipal ownership proposal.

The new contract provides for a reduction in rates for street lighting, water pumping and residential lighting, assessing a franchise tax of 2% on the company's gross revenue. Revised schedules became effective Oct. 1, following approval by the Colorado Public Utilities Commission.

● COMPLAINT that its municipal electric service is inadequate and the rates too high will be studied at Pacific, Wash. by a committee appointed by the town council. Claims have been made that the town must charge a higher rate to operate than would be the case if the system were owned by Puget Sound Power & Light Co., from whom the town buys power.

● MARIPOSA COUNTY Board of Supervisors has approved a county-wide public electricity and gas service franchise for the Central Arizona Light & Power Co. The franchise replaces one formerly held by the company covering only part of the county. It will run for 25 years.

Recently we had an illustration of how much self-supporting aerial cables save over open wire. One of our customers planned to put in a 13 k.v. open wire feeder. In order to get it installed it would have been necessary to go around a town which would have taken 16 miles of open wires. By changing the specifications to Simplex self-supporting aerial cable it was found possible to do the same job with only 2½ miles of line. The saving in this case amounted to a good many thousand dollars because the poles, cross-arms, pins, insulators, line hardware, etc., that were necessary for the 16-mile line did not have to be bought and installed. Instead, the 13 k.v. line, because it was insulated, was suspended from existing pole lines.

Before you plan any type of open wire construction, investigate Simplex aerial cables and see how much you can save on your installation. Simplex aerial cables are dependable, make good looking installations and cost much less to put up in both dollars and man hours, besides a very considerable savings in right-of-way, pole lines, and hardware.

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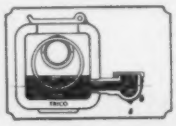
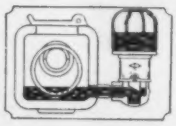
Bearings have either too much or too little oil. It's all guesswork!





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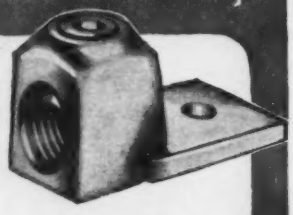

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PEOPLE
made this news

● IRWIN MCNIECE has been named assistant district superintendent of service and erection for the Los Angeles district of Allis-Chalmers Mfg. Co. During the war he had been with the company in Seattle, Tacoma and Portland shipyards. A veteran of World I, McNiece joined Allis-Chalmers in 1912, going to the company from Telluride Power Co., Utah. For many years he was in Manila as Allis-Chalmers representative with the Honolulu Iron Works.

● HARRY W. FINNELL Jr., formerly production manager of the Los Angeles tube division of Phelps Dodge Copper Products Corp., has been transferred to the San Francisco sales office. Since being employed by the company in 1939, Finnell has had experience in several divisions of the company, the tube mill in New Jersey, Habirshaw cable and wire division in New York, the Inca magnet wire plant in Indiana, and the Cleveland sales office.

● GEORGE A. O'BRIEN has been placed in charge of the Northwest sales territory of Phelps Dodge Copper Products Corp., replacing Homer L. Hussey. O'Brien is a native of Seattle and a graduate of University of Washington in 1934. Before going with Phelps Dodge in 1943, he was with John A. Roebling & Co. for a time, and with Seattle-Tacoma Shipbuilding Corp.

● HOMER HUSSEY, Seattle district manager for Phelps Dodge Corp. for the past seven years, has been assigned to a similar position in the San Francisco area. His headquarters will be at 333 Pine St., San Francisco. In the electrical business since 1928, Hussey was with the Puget Sound Power & Light Co. from 1928 to 1938, when he joined Phelps Dodge.

● ROBERT S. SLOAN on Sept. 1 became manager for Westinghouse Supply in the northern California district, with headquarters in San Francisco. A native of the state of Washington, Sloan joined Wesco at Seattle in September 1945. Before his transfer, he was metropolitan appliance manager, Seattle.

● THEODORE K. BURGENBAUCH, for 15 years with G-E at Schenectady, has joined Ellinwood Industries at Los Angeles as electronics division production manager.

HOW THE LAPP LINE POST FOILS FLASHOVER

The Lapp Line Post is a tall, one-piece porcelain body, without pin or other conductive material inside. It offers external air flashover distance as short as inside puncture path. And when an arc does go over it, it is much less vulnerable to damage than conventional insulators. Its short, sturdy petticoats are less affected by rapid heating from the arc, less likely to break. Even if the arc is severe enough to break away petticoats, their loss does not materially decrease flashover or leakage distance, and does not imperil the body. Injury to glaze from burning does not affect insulating value.

Engineers who first saw in the Lapp Line Post something "different-looking," after 15 years of Line Post service recognize that the difference in appearance is more than matched by a difference in performance.

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LINE POST

FLASHOVER DISTANCE LOST 1%

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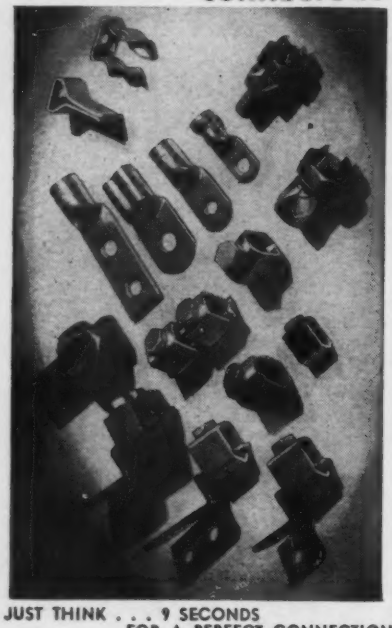

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● W. R. NODDER has joined the George E. Honn Co., manufacturers representatives, San Francisco. Nodder is a University of California graduate, has served Pacific Electric Mfg. Corp. as northern California representative and during the war was instructor in antiaircraft artillery school at Camp Davis, N. C., searchlight battalion commander in the Hawaiian Islands and staff office Headquarters Army Forces in the mid-Pacific. He was released from the Army as lieutenant-colonel in March 1946 and before joining Honn had been engineer for the General Air Conditioning & Heating Co. of Oakland, Calif.

● E. L. SWORDS, acting district manager for the Pacific Gas and Electric Co., has been named district manager of the Santa Maria, Calif., district, according to H. H. Courtwright, San Joaquin Power division manager. Swords succeeds EDWARD C. GILL, who will return to military service with the rank of colonel in the U. S. Army Engineers. With the company since 1927, Swords at the time of his transfer, was local manager at Los Banos.

● W. H. KERR, Oakdale district manager for Pacific Gas and Electric Co., has been transferred to Lodi as district manager. He replaces ROY G. STRUM, who has been appointed to the public relations department in San Francisco. PAUL L. FORD, farm power advisor at Oakdale, was promoted to local manager, and will report to F. Y. KRAFT, Modesto District manager.

● HARRY HUBER, Whitehall, and JOHN TORONGO and FAY MCCALL, Butte, Mont., veterans of from 22 to 38 years, have retired from Montana Power Co. Huber, former manager at Whitehall, started with the company in 1908. Torongo, who retired from the position of credit manager, began work as a collector in 1911. McCall was employed by the company in 1924.

● APPOINTMENT of NORMAN H. MEYERS as sales manager of the Spokane office of General Electric Co. has been announced. An electrical engineer, Meyers came west from Schenectady, where he had been since his graduation from Washington State College in 1938.

● FOUR district men have been brought into headquarters as assistants to H. C. Rice, manager of the domestic sales department of Southern California Edison Co. They are C. V. SOPER, former sales supervisor at Pomona; T. L. BOWLES, home service consultant in the San Fernando Valley district; and G. F. HALY, former credit agent in the Santa Ana district. LESLIE O. SHERMAN, former rate accountant at Fullerton, has been moved into Haly's former capacity and Haly has been transferred to Pomona as sales supervisor, replacing Soper. Soper is handling adequate wiring and contacts with architects and building contractors and Bowles is working with school authorities on domestic science equipment.

● JIM "Your City Light" FERGUSON, superintendent of inside construction, two-time winner of the Harry J. Martin Cup, won the trophy for the third time at the recent annual golf tournament staged by the Electric Club of Washington. Leonard F. Koepp of the U. S. Rubber Co. won second prize and the Matthews Trophy, and Ed Des-Camp of Graybar Electric was third, winning the Frank McLaughlin Cup. Approximately 100 members of the state-wide electrical group participated.

● ROY M. BUTCHER, San Jose electrical contractor, was reappointed for another term to the California State Contractors License Board by Governor Earl Warren recently. Butcher has served on the board since it was first instituted, representing the subcontracting groups, and for two terms was its chairman.

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TRICO FUSE MFG. CO.
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KNOX PORCELAIN CORP.
Electrical Porcelain

● DANIEL K. COYLE has been named sales manager of the Sacramento Municipal Utility District which will take over the PG and E distribution system and begin operating it Jan. 1, 1947. Coyle, many years ago, worked for PG and E in the sales department at San Jose division. Later he was building engineer for the State Bldg. in Los Angeles and during the war had been employed by various engineering firms handling war construction projects. He is building up his sales staff.

● C. R. WALLIS, a sales engineer with General Electric in the East and in Seattle, becomes Northwest district manager, transportation division. In his new position, with headquarters in Seattle, he will supervise and coordinate the apparatus department's sales activities on electrical transportation equipment in the states of Oregon and Washington and in northern Idaho.

● WILFRED H. ROY, with Rheem Mfg. Co. at its Stockton and South Gate plants in California, has been made assistant to the general production manager, with headquarters in New York City. A graduate of the University of California, Roy was with California Wire Cloth Co. in Oakland for eight years before he joined Rheem.

● RECENTLY retired is GEORGE MILES, sales engineer of the Westinghouse Electric Corp. for 40 years, working out of the Seattle and Spokane offices. An Electric Club of Washington member since the organization's inception approximately a quarter of a century ago, Miles states he is going to take up golfing and "loafing" in earnest.

● C. F. TERRELL, vice-president and general manager of Puget Sound Power & Light Co. and Roy Kistler, transmission and protection engineer for the Pacific Tel. & Tel., Seattle, have been recommended for transfer to the grade of Fellow in the American Institute of Electrical Engineers.

● H. M. GUSTAFSON, a University of Washington graduate who served with General Electric in Schenectady and in Europe before being assigned as sales engineer in 1924, moves up to assistant manager of the apparatus department in the company's Seattle office.

● ALBERT T. BERGERON, West Coast district sales manager for the Miller Co., has been appointed sales manager of the company's illumination division, with headquarters at the Meriden, Conn., plant. Miller was headquartered in San Francisco from 1937 until the time of his promotion.

● E. C. CURTIS has been named district manager, central station division, for the Northwest district of General Electric Co. He will be responsible for the sale of apparatus department central station equipment in the Northwest. Curtis, formerly district switchgear specialist, was transferred to Portland from Schenectady in 1925. He will continue to make his headquarters in Portland.

● J. H. DAVIS, Vancouver, B. C., has been appointed superintendent of the electrical department at Penticton, B. C. Davis has had 25 years experience in general construction and in transmission and distribution line maintenance and has operated both hydro and diesel plants. He has been engaged on government contract work since his discharge after four years service with the RCAF.

● CHARLES H. SEEMANN has been appointed manager of the Graham County (Ariz.) REA and will have his office in Pima. During the war, Seemann served as a chief petty officer, training recruits as electricians. He has been associated with REA projects for several years, supervising construction of high lines at various points in the West.

Deaths

● GEORGE M. TRIPP, who retired in January 1944, as general superintendent for the B. C. Electric Railway Co. at Victoria, died suddenly at his home there. Mr. Tripp was 70 years of age and had been 46 years with the B. C. Electric. Born in Woodstock, Ontario, he went to Victoria 48 years ago. He joined the B. C. Electric as an operator and rose to the post of general superintendent. The expansion program of the company on Vancouver Island from 1898 until the construction of the Jordan River plant in 1910 was carried out under his personal supervision.

● ALBERT I. WOODHOUSE, who helped to lay the foundation for power and light service in Utah, died in Los Angeles, following a major operation. While associated with L. N. Nunn, Mr. Woodhouse did much to develop long distance transmission in Utah. He founded the Dixie Power Co., and became manager of Southern Utah Power when that firm purchased the Dixie properties in 1929. In 1931 he became head of the Clyde Henry enterprises, operators of several small plants in Washington and Oregon. Poor health forced his retirement from this position several years ago.

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Buckingham

of Binghamton

Stephens Climbers, manufactured by Buckingham of Binghamton for more than 45 years, have built an international reputation for safety and comfort.

Binghamton Easy Belt No. 58

Safe and comfortable, it's made of tan harness leather, lined with soft chrome lace-leather. No metal contact with the body. Forged Dee-ring and buckles are individually tested.

Why do Stephens Climbers enjoy the popular demand and confidence of utility companies, telephone companies and individual linemen?

Because Stephens Climbers, and all other Buckingham safety equipment, are made under one watchword—*quality*. Each climber is tested for safety and carefully inspected to meet the rigid standards and exacting requirements of safety engineers. Every care has been taken to provide comfortable equipment. Our patented Right and Left Climbers, for example, are a distinct improvement which adds materially to the safety and comfort of the linemen.

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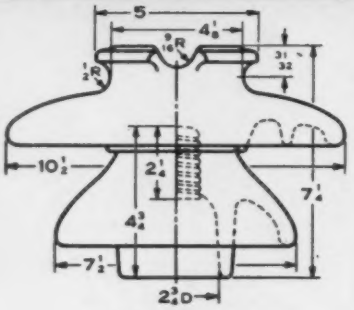
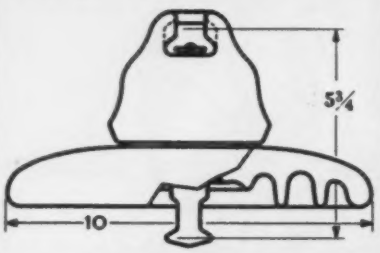


NO. 2124-M
45 Kv. Rating

Dry Flashover . . . . . 125 Kv.
Wet Flashover . . . . . 85 Kv.
Rec. Pin Height . . . . . 8 In.
Std. Pkg. Crate 6

This insulator generally used on 33 Kv. can also be furnished in one-piece design (No. 1924). Mechanical, thermal and electrical characteristics are well balanced insuring long life in service.



NO. 21243
15,000 Lb. Min. Combined M. & E. Rating

Dry Flashover . . . . . 80 Kv.
Wet Flashover . . . . . 50 Kv.
Leakage Distance . . . . . 11½ In.
Std. Pkg. Crate 6

This design is offered in a wide range of spacings in both Ball-Socket and Clevis types which fulfill all strain insulator requirements.

● Service records prove these units will serve faithfully under all conditions. Call our nearest sales representative for speedy delivery.

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THE R. THOMAS & SONS CO.
LISBON, OHIO

● Henry Harrison Jones, affectionately known as "HH" for the 14 years he was president and general manager of the San Diego Gas & Electric Co., died Aug. 5 in San Diego. He had been retired because of ill health since 1928. Born in Reading, Pa., 1874, a graduate of Lehigh University 1895, veteran of the Spanish-American War, he began his utility experience in street railways and in the construction of the Denver Tramway Co.'s power house. He was made manager of the San Diego company in 1910 and in 1924 went to Minneapolis as vice-president in charge of operations of the Northern States Power Co., another Byllesby property. In 1926 he was transferred to Stockton as vice-president of the Western States Gas and Electric Co. and vice-president of California-Oregon Power Co. When PG and E purchased the Western States Gas and Electric Co. Jones retired and returned to San Diego. Characterized by an exceptional executive ability, he developed the personnel of his company while he stayed in the background himself. Avoiding detail he regarded his position as that of the representative of the customers, for whom he always kept himself available, and the stockholders whose interests he watched. Although not active in the company since 1924, his influence on personnel and public relations remained for many years afterward.

● James Enon MacDonald, secretary of the Los Angeles Joint Pole committee from its organization in 1907 to his retirement in 1940, died Aug. 8. He was born in New Glasgow, Nova Scotia, Canada, on Oct. 27, 1874, and was a graduate of McGill University, Montreal, in electrical engineering. Mr. MacDonald went to the committee from the Pacific Electric Railway Co. which he had joined in 1902, at the time that company was actively engaged in expanding its rail facilities to cities and towns lying within a 60-mile radius of Los Angeles. Prior to his retirement he had been active in several engineering societies and also was a past president of the Los Angeles Section AIEE.

● Burdett Moody, retired executive of the Los Angeles Department of Water & Power, died at his home early in September. He was 80 years old. Mr. Moody had been with the department 26 years when he retired in 1940. He was born in Yankton, S. D., and was graduated from the Massachusetts Institute of Technology. Before going to Los Angeles he had been employed by the city of San Francisco and the city of Pasadena. At the time of his retirement he was head of the department business agents division.

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Jeffries Transformers

Reasonable in Price
Reliable in Performance

Jeffries large transformers are priced reasonably—and you can save their first cost in a short time by minimizing current losses. When you use a Jeffries transformer, you can provide voltage change at the point desired, without prohibitive expense.

We supply all types and sizes. If not in stock, we build to order in a hurry—a week to 10 days.

Write today for catalog

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1710 E. 57th St. Los Angeles 11, Calif.

ALL the strength and durability inherent in steel are combined—with definite economies—in Crapo Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous Crapo Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of Crapo Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

Company Community Country

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● **Participants in the Payroll Savings Plan benefit directly in terms of cash—because U. S. Savings Bonds at maturity pay $4 for every $3 invested.**

Your company, your community, and your country benefit indirectly in terms of security—because: (1) Employees with a solid stake in the future are likely to be stable, productive workers. (2) The Bond-buying habit of local citizen-employees means a reserve of future purchasing power—a safeguard for the stability of your community. (3) Every Bond bought temporarily absorbs surplus funds and helps check inflationary tendencies.

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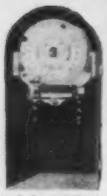
This Time It's For *You*—A booklet for employees ... explaining graphically how the payroll savings plan works ... goals to save for, and how to reach them with Savings Bonds.

The Treasury Department acknowledges with appreciation the publication of this message by

ELECTRICAL WEST

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council

"A TORK CLOCK IS A FAMOUS NAME FOR TIME SWITCHES"



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NOW WITH ASTRONOMIC DIALS

For all types of electrical switching and time control, Tork Time Clocks will control operations efficiently and automatically. Self-starting, all-electric. For minutes, hours, days or weeks. Special models designed to specifications.

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Immediate delivery on all
"BUCKINGHAM" and "STEPHENS"
LINEMEN'S EQUIPMENT

No. 58 Floating Tool Belt

No. 42-A 2" x 6' Safety Straps

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Stephens "Offset" Right and Left Climbers →

We carry a complete line of linemen's equipment

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General Western States Agent and Distributor

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95 Ninth St. San Francisco 3

TRADE notes

Spokane Firm Purchases Heater Patent Rights

Eric A. Johnston, president of the Columbia Electric and Mfg. Co., Spokane, has announced that the firm will manufacture and distribute in the eleven Western states a new portable infrared electric heater.

He added that patent rights for this region have been purchased from the Radiant Heater Corp. of New York and that dealer agencies and distributing centers are being established.

Production of 8,000 units is to begin at once in the Spokane plant. Of glass with plastic trim, the heater is for home and office use and is portable.

● D. F. COURTLEIGH has been made RCA-Victor radio division representative for L. J. Meyberg Co. in San Francisco. ALLAN PONTIUS, former head of the Eureka vacuum cleaner and domestic sewing machine and traffic appliance department, has been moved into the administrative branch and HERB ATWATER named in his place. J. M. SCALES, a major in the Chemical Warfare Service of the Army, has been appointed advertising manager for the San Francisco house.

● E. J. BAUGHMAN, well known for his connection for many years with the Hotpoint organization and prior to that, with Schwartzbaugh, has gone into business for himself as a manufacturers' representative in the southern California area with headquarters in Los Angeles.

● GEORGE C. TOLTON has been named sales representative in the Northwest states by American Foundry Equipment Co. His headquarters will be in Seattle. DAVIS G. TAYLOR is sales representative for the San Francisco Bay area, and DAVID E. NEUSTADT for the Los Angeles area.

● COOK ELECTRIC CO. of Chicago has appointed J. B. Wilson as manager of its West Coast division. The company makes pressure switches, relays, aircraft controls, wire communication equipment and other items. Cook has temporary headquarters at 1630 Fairview Ave., Burbank, Calif.

● EARL'S ELECTRIC Appliance Co. of Tonasket, Wash., is more than doubling its floor space. According to E. Reid, owner, the new space was to be opened the last of August. It will house a radio, phonograph and record department.

● GEORGE M. BOYD, for many years lighting specialist with the Westinghouse Electric in Seattle, and recently retired, has established his own firm. He will specialize in lighting engineering, including street and aviation layouts, and will serve as manufacturers' representative. Offices have been opened for the firm at 95 Connecticut St. in Seattle.

● IN CONNECTION with its expansion program, Palmer Mfg. Co. of Phoenix is building a new plant, according to Oscar C. Palmer, president. The building will contain 60,000 sq. ft. and will be specially constructed for manufacturer of sheet metal products, including evaporative coolers.

WANTED
ELECTRICAL PROJECT ENGINEER

One (1) experienced graduate engineer, responsible charge electrical engineering and design of steam-electric and hydro-electric power plants and high voltage substations. Applicants please furnish personal data and Experience Record.

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Owner selling only exclusively dynamic and static balancing business in ind. area 4,000,000 pop. now in oper. and for past 18 years. Net profit last 12 operating months over $2,000 per mo. Books can be audited by bona fide prospective buyer. Actual inventory value of land, bldg., and equipment, $30,000.
Owner retiring, will accept offer at inventory value, plus reasonable amount for good will to be agreed upon after prospective buyer has interviewed present customers, and seen possibilities.
Present personnel will remain to assist. Temporary living quarters available. **Write Box 782, Preuss Station, Los Angeles 35, Calif.**

Sale* – MICARTA PLATE – *Sale

Westinghouse GR-219, natural finish

63 sheets ⅜" x 36" x 48"
33 sheets ⅜" x 38½" x 48"
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Price $56.00 per C-lbs., FOB Portland, Oregon. Full freight allowed to points Chicago and west. Orders accepted on full sheets only and for 300 pounds or more, subject to prior sale.

Northwest Procurement & Sales
107 N. W. Couch St. Portland 9, Oregon

● L. A. BLACKBURN has resigned his post as Midwest division manager for Fostoria Pressed Steel Corp., to become southern division manager for Manufacturers Marketing Service, with headquarters in Los Angeles. Blackburn formerly was with Westinghouse Supply on the West Coast. Manufacturers Marketing Service covers the Pacific region with sales engineering offices in San Francisco, Los Angeles, Seattle and Denver. It represents McQuay-Norris Mfg. Co. of St. Louis, Circo Products Co. and Watco Engineering Inc., Cleveland, Safety Electric Co. and U-C-Lite Mfg. Co., Chicago, and Fostoria Pressed Steel Corp., Fostoria, Ohio. C. W. McDaniel is general manager.

● HAROLD W. FREDERICK of the Harold W. Frederick Co., sales engineer and manufacturers representative, has announced the opening of new and enlarged offices in Spokane at N. 213 Division. The firm specializes in wholesaling and distributing heating, cooling and ventilation equipment and steam and power plant equipment. Frederick also announced that the staff is being increased by the addition of John L. Harvey, a navy veteran and a graduate of the University of Washington in mechanical engineering.

● J. ALLISON is now in charge of the radio service department of J. C. Roach at Victoria, B. C. Roach has been engaged in radio service work for the past 14 years. Allison held the rank of lieutenant in the navy, and was stationed at naval service headquarters in Ottawa during the war. He was in charge of radio inspection, and later was assistant radio supply officer for the department.

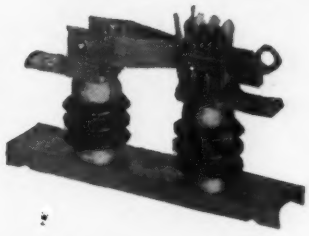
● A. B. GRAY has been appointed resident manager at Victoria, B. C. for the Farwest Trading Co., Ltd., which has established offices at 2020 Douglas St. This company is Canadian distributor for the Whittaker ultraviolet lamp and other ultraviolet and electrical equipment. The lamp is manufactured in British Columbia by ex-service personnel.

● HORNBROOK'S Service & Market of Terra Bella, Calif., has been franchised as a Westinghouse dealer and will handle a complete line of home appliances. The store, owned by F. H. Hornbrook, is located on Highway 65.

● GRAYBAR ELECTRIC Co. in San Diego has moved to a new building at 720 State St. GORDON'S REFRIGERATION CONSTRUCTION Co. moved into the vacated Graybar building at 106 W. Market St., San Diego.

EARL S. CONDON COMPANY
357 S. Hill Street Los Angeles 13, California

COLE ELECTRIC CO.
Disconnecting Switches



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Mallory Type "P" Capacitor:—Plastic case overcomes moisture absorption problems, and provides maximum insulation. May be used to replace cardboard insulated aluminum-case capacitors. Splash-proof plastic end cap and simplified "snap on" mounting bracket available when capacitor is used as original equipment.

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Impressed on Each Piece of Victor Porcelain THIS SYMBOL OF QUALITY
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VICTOR, NEW YORK

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Electrical West, published monthly at San Francisco, Calif., for October 1, 1946.

State of California } ss.
County of San Francisco }

Before me, a notary in and for the state and county aforesaid, personally appeared George C. Tenney, who, having been duly sworn according to law, deposes and says that he is the Editor of the Electrical West, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, McGraw Hill Co. of California.....68 Post St., San Francisco 4, Calif.
Editor, George C. Tenney.....68 Post St., San Francisco 4, Calif.
Managing Editor .....None
Business Manager .....Roy N. Phelan, 621 S. Hope St., Los Angeles 15, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

McGraw-Hill Company of Calif., San Francisco, Calif.; McGraw-Hill Publishing Company, Inc., New York City; James H. McGraw, New York City; Howard Ehrlich, New York City; R. A. Balzari, San Francisco, Calif.; N. A. Bowers, San Francisco, Calif.; George C. Tenney, San Francisco, Calif.; John W. Otterson, San Francisco, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is..... (This information is required from daily publications only.)

GEORGE C. TENNEY, Editor.

Sworn to and subscribed before me this 14th day of September, 1946.

(SEAL) W. E. SCHORD.

(My commission expires June 2, 1950.)

In and for the City and County of San Francisco, State of California.

● Don D. Carpenter has established the Research Industries Ltd. at 1086 Homer St., Vancouver. The new company will specialize in the engineering and manufacture of electronic equipment, particularly in needs of the fishing, lumber, mining and shipping industries. Carpenter was at one time with B. C. Electric and during the war was technical assistant to the director of electrical and communications design and to the director of the communication and fire control production branch. He was discharged with the rank of major.

● Cook's Radio and Appliance Co. of Spokane has filed articles of incorporation for the firm, which operates a radio store and appliance shop at W. 223 and W. 260 Riverside. The incorporators are E. C. Cook, Ruby A. Cook and Ray Wilson, all of Spokane, and capitalization is set at $50,000. Cook announced that the incorporation is in anticipation of an expansion program.

● Lowell Wood has rejoined Packard Bell Co. as vice-president and assistant general manager. He was formerly with this company but started a distributorship under his own name in San Diego. The Lowell Wood Co. will continue under the same ownership but with "Red" Towne as manager.

● Moore Engineering Co., 528 Corbett Bldg., Portland, will manufacture a radiant baseboard invented by William A. Ellis. (Described in Electrical West, May 1946, p. 68.) According to C. A. Moore, the company hoped to be able to start delivery the first of October.

● The Retail and Wholesale electrical appliance store of the R. T. Carr Sales Co. at W. 919 First Ave., Spokane, has been sold to Arthur G. Gruettner. Carr will retain the welding business he operated in connection with the electrical supply house.

● Biber Electric Co. has been established as an electrical contracting business at 734 El Camino Real, San Carlos, by William S. Biber, son of Al Biber of Eureka Electric Co., San Francisco.

● Arrow Electric Co. "continuously in operation since 1908," electrical contracting and engineering firm of Seattle, has moved to 224 Dexter Ave., Sam Helper, its owner, has announced.

● S&M Lamp Co. celebrated its 37th birthday Aug. 9, according to Jim and William G. Shirreffs, president and vice-president, respectively.

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*

This system of Buckeye conduit, installed in a large department store a generation ago, still provides dependable wiring protection to owners and tenants.

RACEWAYS to lasting safety

WHEN you're planning wiring systems for the buildings of tomorrow, safety is naturally a first consideration. Not only safety, but *permanent* safety!

The electrical industry has long since agreed--and incorporated it in the national code--that the one safest system for the lasting protection of electrical wiring is that employing heavy-wall steel conduit. This is the only system approved for use in hazardous locations and occupancies, as being dependably moisture, vapor, dust, and explosion proof.

So for positive protection, install permanent raceways of full-weight, rigid steel conduit--"Buckeye" conduit. Wiring is easily changed to meet changing day-to-day needs, yet the conduit remains in place, as raceways to lasting safety.

Youngstown "Buckeye," the world's most widely used standard-threaded, full-weight, rigid steel conduit, is sold by leading distributors in all markets.

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Ask your distributor for:
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PROFILES *of the month*

Above: Gilbert C. Delvaille (left) and Fred Oldendorf Jr., elected vice-presidents of California Electric Power Co.

Center: Jean Lamoreux, new home economist for the north Pacific district of Westinghouse Supply, Seattle, is a 1945 graduate of University of Washington. Her territory will include Seattle, Tacoma, Spokane, Portland and Butte and the surrounding areas

Below: H. C. Glaze Jr. (left) and J. F. Goggins transferred by General Electric apparatus department. Gogins is now assistant to W. F. Hynes, Northwestern district sales manager, Portland. Glaze succeeds him as Spokane manager, apparatus sales department

HORSEPOWER... *for a rainy day*

Among P. G. and E.'s 136,000 stockholders are nearly 450 insurance companies, banks, investment trusts and security companies located all over the United States.

These institutions represent the savings of millions of people for "rainy days" which at some time or another come to everyone's life. And P. G. and E. is proud of the confidence shown in us by these investors.

The American habit of saving for the future is a good habit. Investing in reliable financial institutions, which in turn invest in sound American business is good "horse sense." It reflects faith in our American way of doing things and confidence in the ability of privately-owned business to continue providing maximum production, jobs and the highest standard of living the world has ever known.

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SELL THIS GILT EDGE INVESTMENT

Modern lighting installation, Oakland Plant, Continental Can Co. 3-tube daylight fluorescent 50 footcandles illumination.

GOOD industrial lighting pays real dividends right from the start. Here's what the United States War Production Board said about it in the Board's publication *Plant Efficiency*—

"An adequate and well-designed lighting system brings to the plants:

1. **Increase Production**
2. **Better Workmanship**
3. **Continued Production by Older Employees**
4. **Less Eyestrain**
5. **Reduction in Accidents**
6. **Better Morale**
7. **Better Housekeeping"**

All these factors show up in your customer's balance sheet. Sell good industrial lighting and you sell better employee relations, increased production and profits. For additional information consult your local utility's lighting engineers.

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